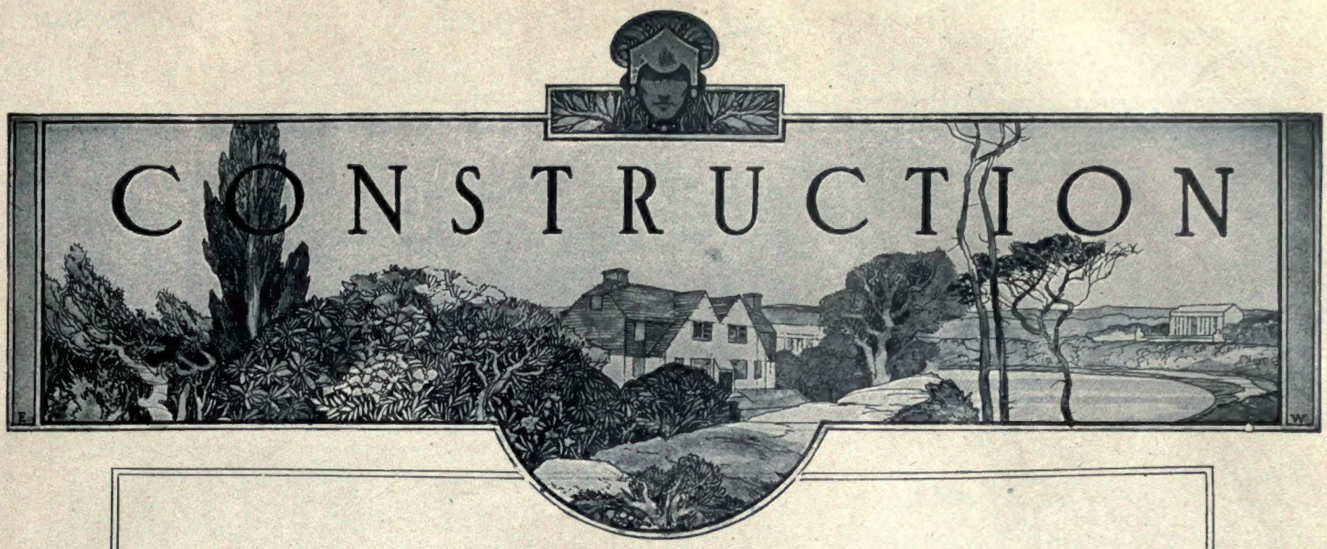
Molesworth, West & Secord
Registered Architects.

GIFT
OCT 1 6

P
Technol.
C



Toronto, January, 1921 Vol. XIV., No. 1

CONTENTS

CONSTRUCTION AT THE UNIVERSITY OF ALBERTA 3
By Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A.

O.A.A. NOTES 12

RESIDENCE OF DR. GEOFFREY BOYD, TORONTO 14

HOUSE ON JACKES AVENUE, TORONTO 16

IS "COST PLUS" JUSTIFIED 17

ONTARIO TOWN PLANNING CONFERENCE 18

RECENT BRANCHES OF THE CANADIAN BANK OF COMMERCE 21

LANDS FOR PUBLIC PURPOSES 26

EDITORIAL 29
Ontario Engineers' Draft Bill on Legislation.

THE DRAFTSMEN ASSOCIATION 30

WAREHOUSE OF SOREN BROTHERS, TORONTO 31

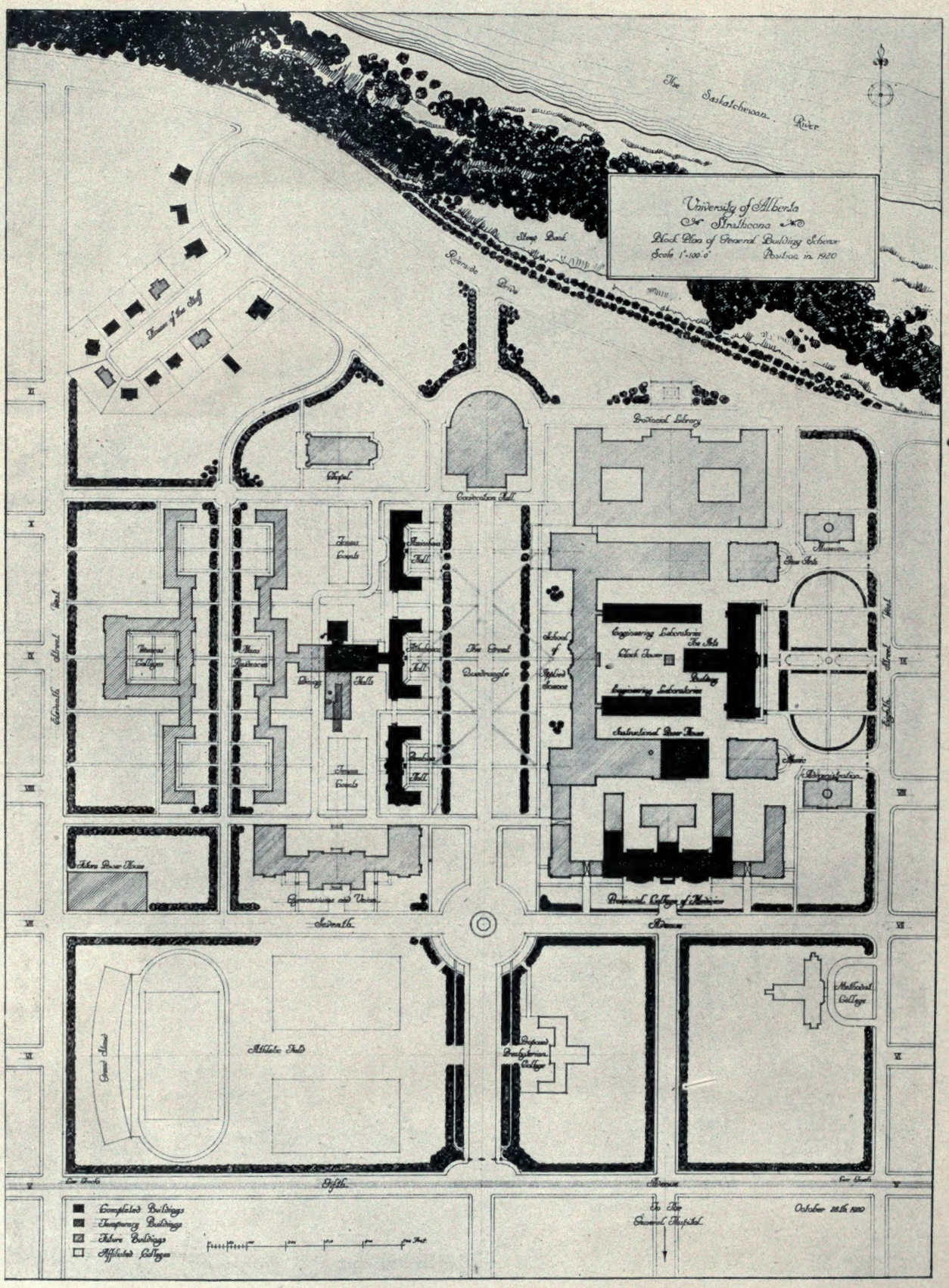
Full Page Illustrations

BLOCK PLAN, UNIVERSITY OF ALBERTA, EDMONTON 2

EAST FACADE, ARTS BUILDING, UNIVERSITY OF ALBERTA 9

GENERAL VIEW, UNIVERSITY OF ALBERTA 10

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



1.—BLOCK PLAN OF GENERAL BUILDING SCHEME.

UNIVERSITY OF ALBERTA, EDMONTON.

LIBRARY
JUL 11 1967
UNIVERSITY OF TORONTO

Construction at the University of Alberta Edmonton

By Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A.

IN presenting the plans for the Provincial College of Medicine, now under construction at the University of Alberta, it is necessary to say something of the general scheme for the University development of which these will form a related part. The present construction, for immediate medical requirements, is not a finished entity, a complete unit, or even a self-contained group. It must be understood as a nucleus that can be enlarged at five points, and in as many directions.

The general scheme for the University of Alberta is a frank attempt to cope with the problems of rapid growth without resorting to the easy expedient of multiplication of separate buildings. In a University, great convenience, both of use and administration, is to be derived from the co-ordination under one roof of the accommodation allotted to groups of departments.

The University of Alberta sprang into being in 1908, only a year after the birth of the Province. In the spring of 1909, Dr. H. M. Tory, the President of the University, adopted the principle of *continuous expansion* of large units as the basis for his scheme of buildings. A general block plan sufficient to determine the positions of the first residences, without prejudice to other development, was then drawn out, and two residences, Assiniboia Hall and Athabasca Hall, were at once erected by the Department of Public Works.

These Halls served for the initial activities of the University, classrooms being temporarily arranged in spaces destined, but not then immediately required, for residential accommodation.

In the summer of 1912, Mr. Frank Darling and the writer were invited to visit the site and make a joint report with respect to future developments.

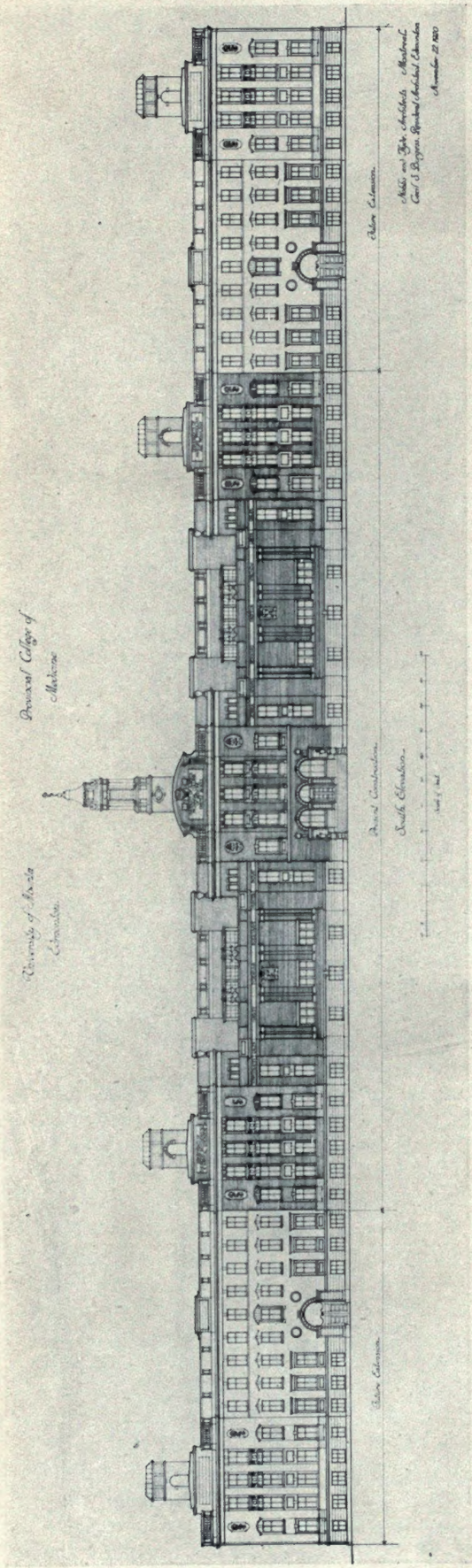
It will be remembered that some of the more recent buildings had by that time made their appearance on the Toronto University campus, and a drastic remodelling of the whole group there was under consideration, while McGill University had experienced the calamitous fires of April, 1907, and had realized, in the process of reconstruction, how very rapidly university buildings can be outgrown or become obsolete. The Toronto buildings, while homogeneous in scale, varied a good deal in type, and suffered as a group from diversity of color and material. At McGill, on the other hand, a homogeneous material of exquisite dignity went far to unify a heterogeneous mixture of types, placed with a certain haphazard picturesqueness, but little regard for general effect or ultimate development. Both of these great universities were suffering, and would suffer yet more, from lack of a comprehensive plan embodying an earlier realization of their future development.

And besides the necessity for adequate foresight, there were two points of great importance to the matter in hand on which Mr. Darling and the writer saw eye to eye. One was that factory lighting and unit planning are not only applicable, but indispensable, to efficiency combined with economy, in laboratory design; the other was that climate, materials and tradesmanship alike forbade the use of the mullioned styles of collegiate gothic on the prairie in the twentieth century.

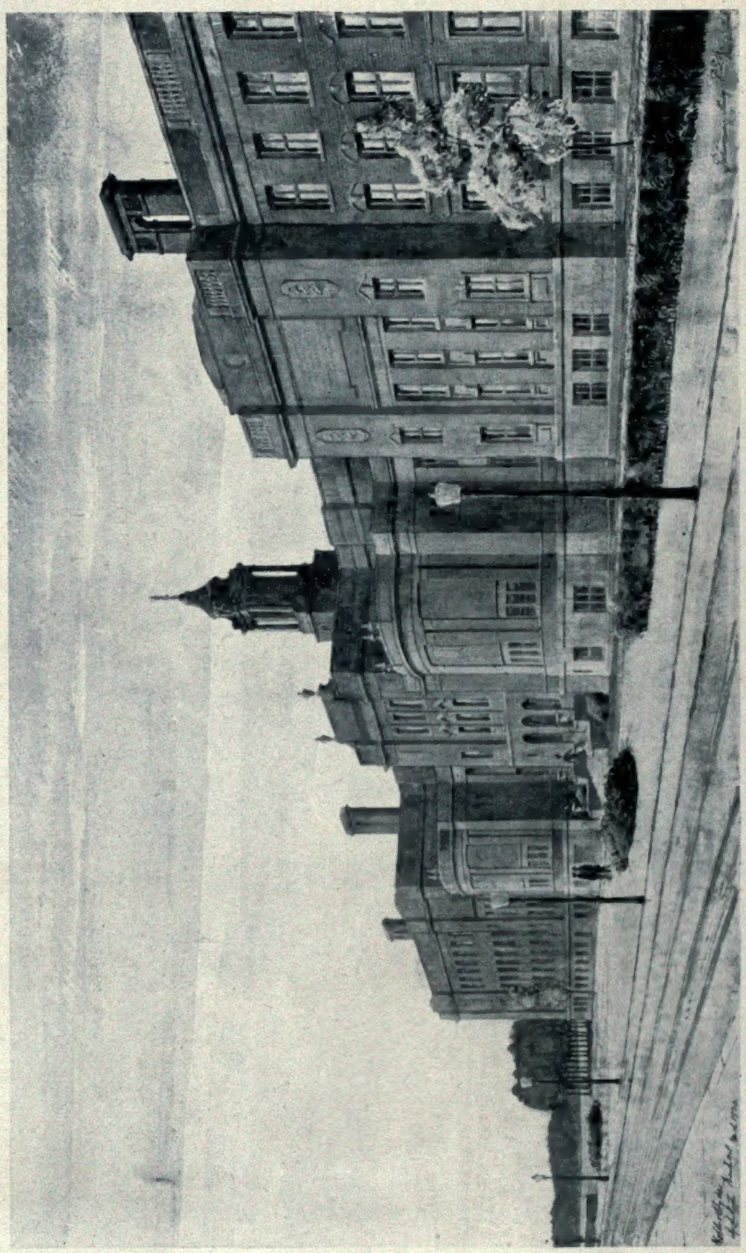
So the President of the new University set us to work on a scheme with top-light and saw-tooth roofs wherever possible; a University that was to appear presentable and explicit after a few years of growth and which could be added to without replanning throughout up to such time as its accommodation should rival in extent anything now existing in the Old World. And if that time ever came, we were all agreed, another University should be begun elsewhere. The site available was unlimited for the purpose, a mile by one-third of a mile in extent, with the gorge of the Saskatchewan River at its northern end. The two existing halls and the probable sequence of requirements had, of course, to be reckoned with as factors to be incorporated in the future scheme.

The common defect of general planning from which many of the older American universities suffer is due to adhesion to the idea of a campus around which the buildings grow, eyeing each other's rapidly evolved succession of modes and styles in odious comparison from a damaging proximity. Then, when the circle is complete, the centre has to be filled up with a growth which adds to the menagerie quality of the group, and at the same time converts the whole institution into a builder's yard during the operation.

The attached "Block Plan of the General Building Scheme" (1) shows future possibilities and the development to date. It will be noticed that a third hall for residential purposes, and the Dining-room Block, have been added, Mr. C. S. Burgess A.R.I.B.A., being the architect, while the Arts Building and several



4.—FACADE OR SOUTH ELEVATION.

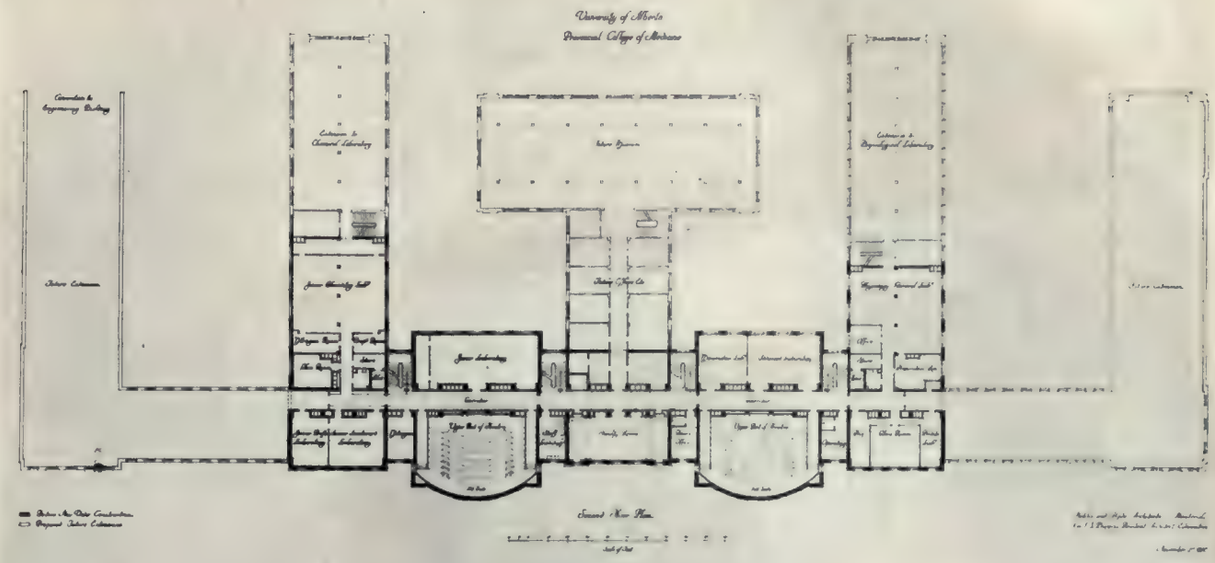


5.—PERSPECTIVE SKETCH.

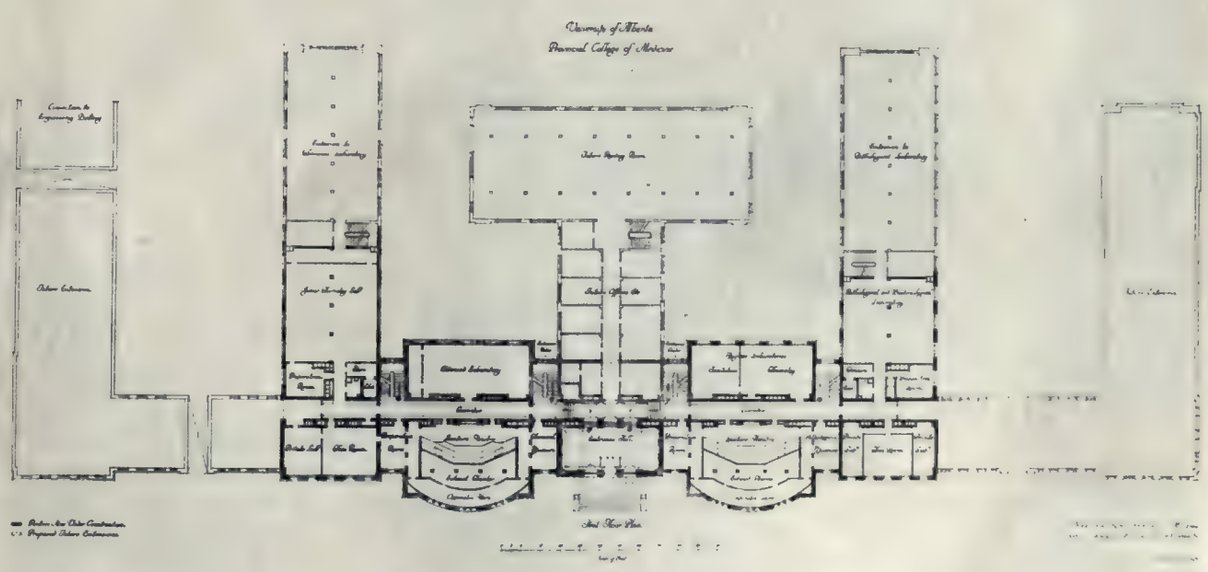
NOBBS AND HYDE,
ARCHITECTS.

CECIL S. BURGESS,
RESIDENT ARCHITECT.

PROVINCIAL COLLEGE
OF MEDICINE
UNIVERSITY OF
ALBERTA, EDMONTON.



2.—SECOND FLOOR PLAN.

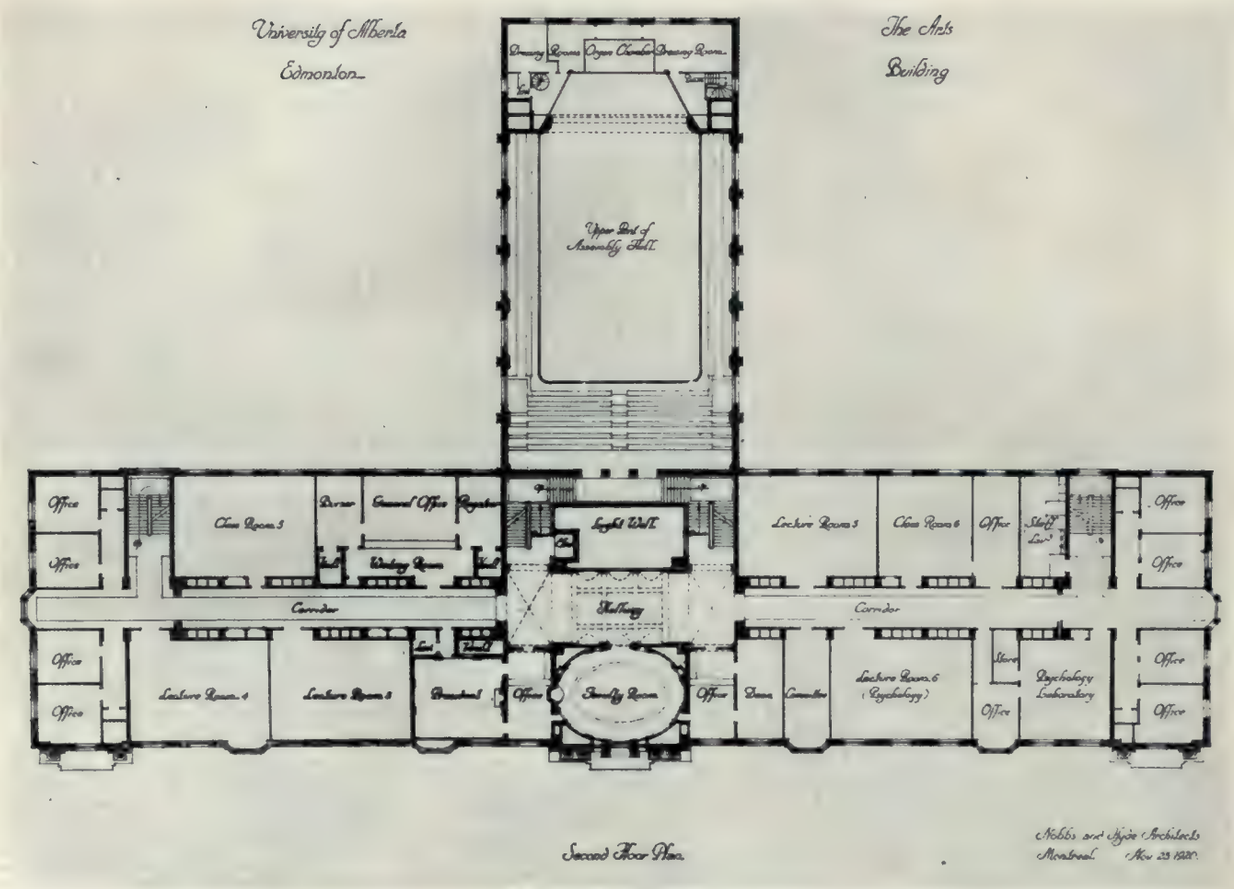


3.—FIRST FLOOR PLAN.

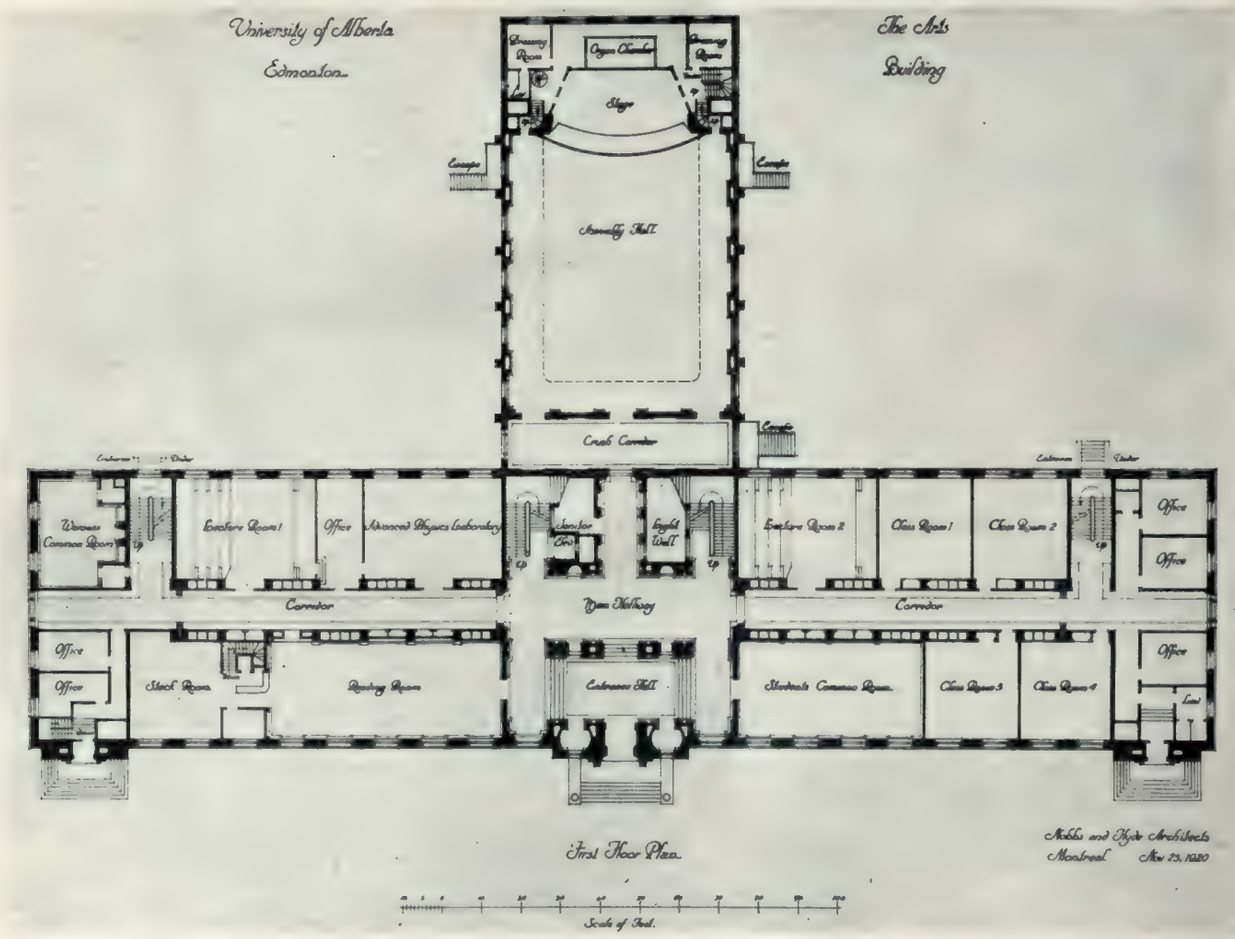
PROVINCIAL COLLEGE OF MEDICINE, UNIVERSITY OF ALBERTA, EDMONTON.

blocks of economic laboratory construction, including the Temporary Heating Plant (later to become the Instructional Power-House) have been carried out from the design of my own firm. One of the laboratory blocks was run up immediately on the close of hostilities, to furnish urgently required accommodation for departments swelled by the reaction after the war's interruption to professional training. The Provincial College of Medicine, on which my firm is associated with Mr. Burgess, the resident architect of the University, is now nearing completion.

In laying out the University property, it was



6.—SECOND FLOOR PLAN.



7.—FIRST FLOOR PLAN.

decided to carry one public road, with car tracks right across it, Fifth Avenue being selected. Seventh Avenue, without tracks, is also carried through the property. The Hospital and the Experimental Farm are to the south of the car tracks, and the space between Fifth and Seventh Avenues is allocated as sites for the sectarian colleges and for use as playing fields, etc.

The residential side of the University is then separated from the teaching buildings by a great quadrangle or "campus," on which face the three existing halls. To the west, behind these halls, the residential quadrangles and blocks will be erected as time goes on. The residential colleges for women will occupy the most westerly sites of the group. A colony of cottages and houses for the staff is already in process of development to the north of the residential group, and the Union, Gymnasium, Swimming Baths, etc., for men and women students are destined to cover the south flank and face on the playing fields.

The end of the quadrangle or campus which divides the teaching from the residential group of buildings is reserved for the Convocation Hall, a dominant mass, linking the scheme together as a whole.

Coming now to the group of teaching buildings, the north, east, south and west sides will be occupied, respectively, by the Provincial Library, the Arts Building (built), the Medical Building (central section under construction) and the Applied Science Building. The development to the north will probably be a large unit simply massed to tell from the high opposite banks of the river, half a mile away and more. In the case of the eastern side, the Arts Building is designed to form the recessed centre of a great hollow fore-court, supplementary buildings for music, architecture, museum and administration purposes, etc., being grouped on each side of the Arts Building and nearer the boundary street. On the south, the Provincial College of Medicine will, in time, occupy the whole side. The road connecting the Hospital with the Medical College is axial with respect to these buildings. On the western side, facing on the quadrangle or campus, the Science Buildings will extend between the Medical College and the Provincial Library.

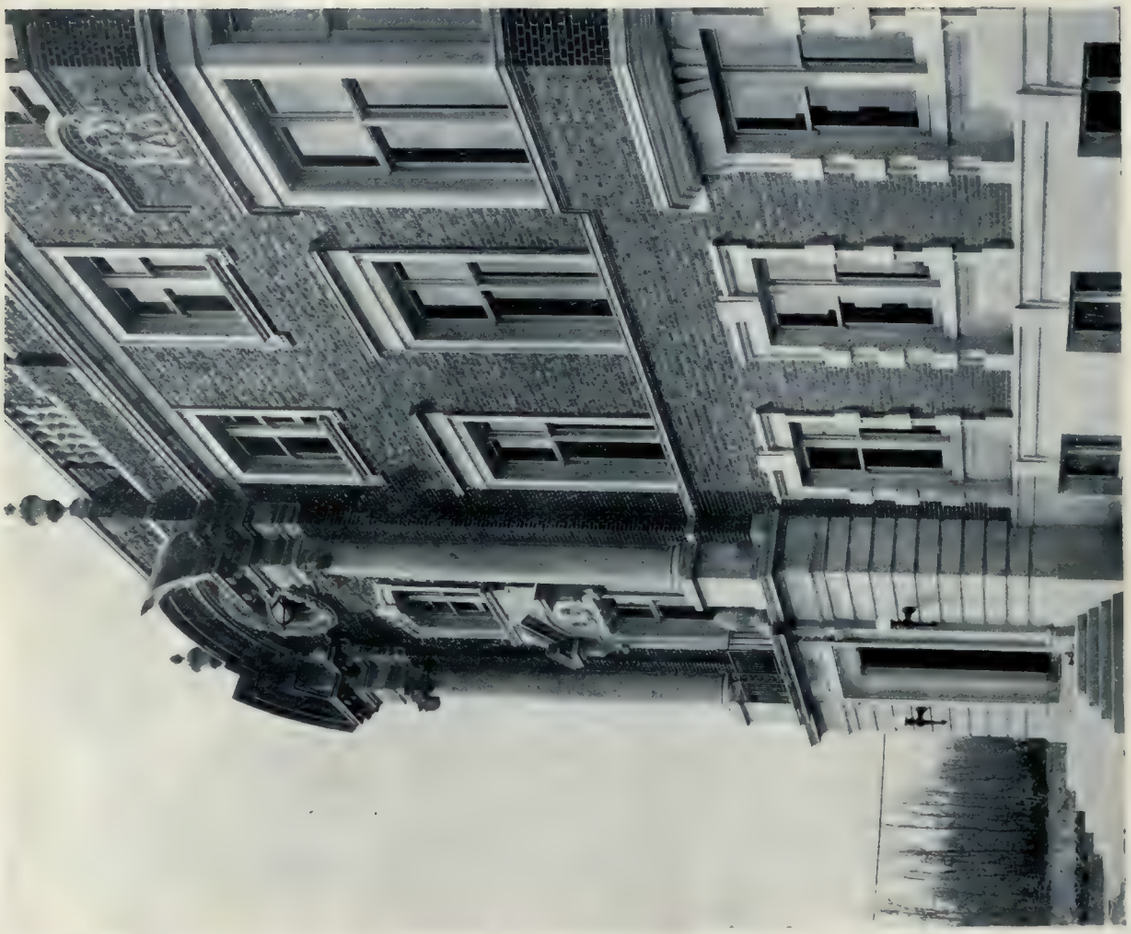
By this arrangement it is hoped to avoid duplication or division of the scientific laboratories. Chemistry, for instance, will develop in a location adjoining both Medicine and Applied Science, as will also Physics.

Each outer side of the teaching group will grow from its own centre, and the four centres will, in all probability, be well started within a few years. The periphery of the teaching group being once completed, the great internal yard remains to be filled, as required, with laboratories and extensions.

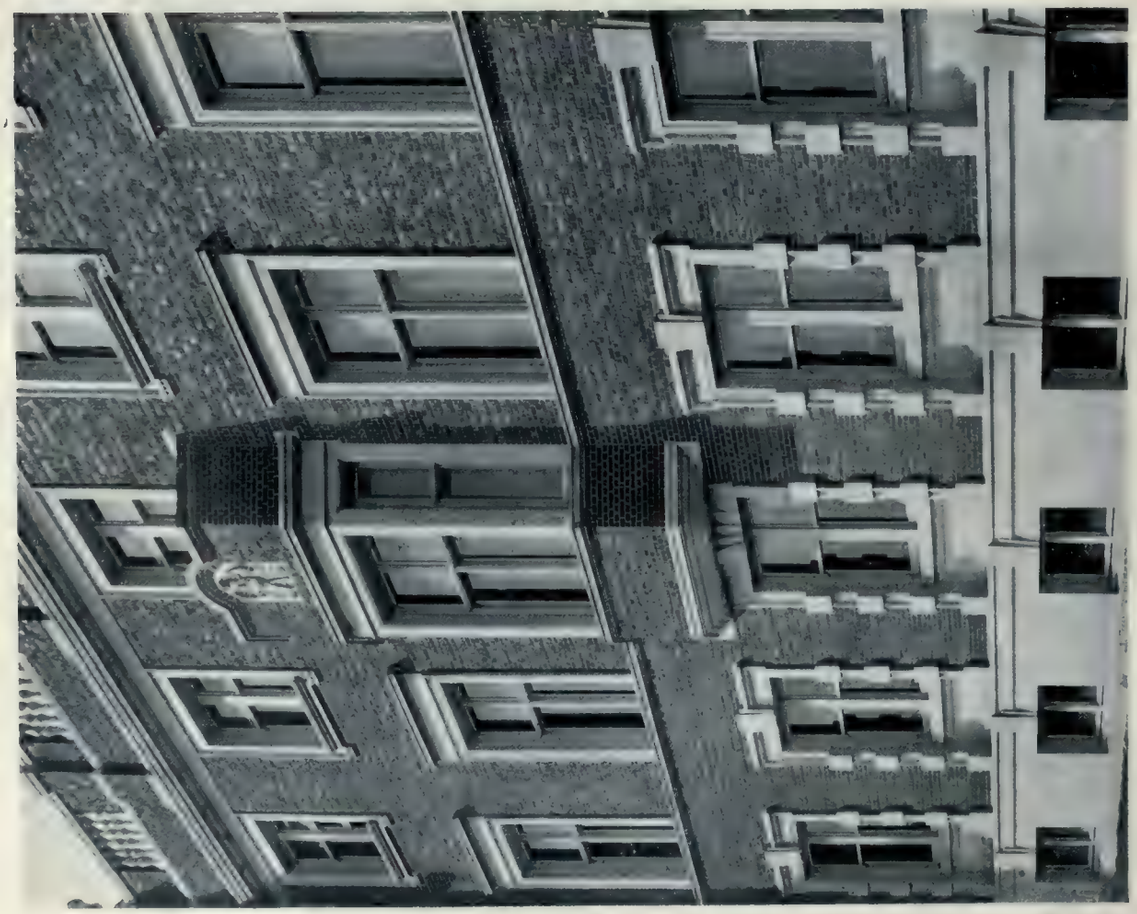
8.—DETAIL OF REAR DOOR, ARTS BUILDING, UNIVERSITY OF ALBERTA.

It will be noticed that the one and two storey Engineering Laboratories generally run east and west and are lighted by long skylights facing north, and that the larger Medical Laboratories generally run north and south, with saw-tooth lighting for top floors and side lighting below. Most of the lesser laboratories of the Medical College have north light only.

At the intersection of the main axes of the teaching group a site is reserved for a lofty



10.—DETAIL OF END ENTRANCE.



9.—BRICK AND STONE DETAIL.

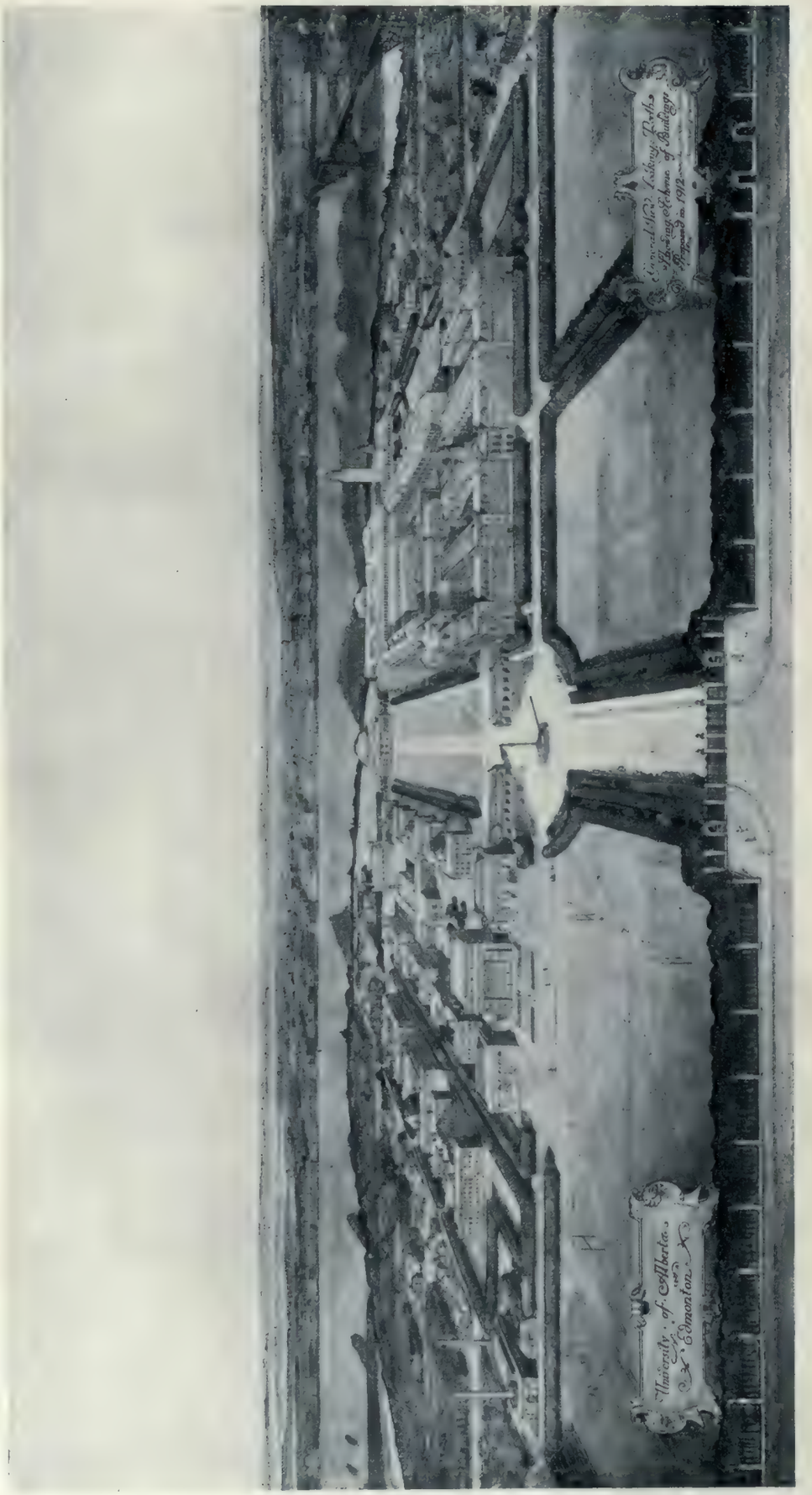
ARTS BUILDING, UNIVERSITY OF ALBERTA, EDMONTON.

NOBBS AND HYDE, ARCHITECTS.

11.—EAST FACADE.

ARTS BUILDING, UNIVERSITY OF ALBERTA, EDMONTON.

NOBBS AND HYDE, ARCHITECTS.



12.—GENERAL VIEW LOOKING NORTH.
UNIVERSITY OF ALBERTA, EDMONTON.

13.—NORTH ELEVATION (GENERAL SCHEME).

14.—EAST ELEVATION (GENERAL SCHEME).

UNIVERSITY OF ALBERTA, EDMONTON.

clock tower. Rising from the centre of the great yard, the clock and chimes will be where most seen and best heard, while from a distance the tower will serve at once as a monumental landmark and a focus for the surrounding scheme of buildings. The architectural necessity for this clock tower will not arise until the two main groups are further developed than at present, and the teaching group itself, of which it will form the central feature, showing definition of form on all four sides.

The first and second floor plan of the Provincial School of Medicine (2) and (3) illustrate the general relation of the present construction to future developments. The facade, or south elevation of this building (4), is drawn with present construction ruled in for brick joints and the future developments in line only.

The perspective sketch (5) represents a rough preliminary study for the facade as a whole. It differs from the work as executed in some minor particulars only.

The first and second floor plans of the Arts Building (6) and (7), as completed in 1915, show teaching accommodation of a generalized type. Details of this building (8), (9), (10) and (11), while they cannot render the rich mosaic of the color, give some idea of the excellent texture and finely executed "cross" or "broken" English bond of the brickwork.

The general perspective (12) and the north and east elevations (13) and (14) for the whole scheme, made in connection with the report of 1912, are of interest for purposes of comparison with what has actually been done. In preparing these general drawings, there was no attempt to design, at a blow, so to speak, an infinitely complex whole. Main lines were established, main sites were allocated, and the general types of buildings suitable for the various purposes were indicated.

O. A. A. Notes

The Toronto Chapter of the Ontario Association of Architects is pursuing an active policy with a representative attendance at the luncheons and much profitable discussions of interest to its members. At a meeting held on December 21st, Mr. H. B. McGiffin was appointed chairman for the calendar year of 1921, and Mr. F. H. Marani, secretary-treasurer. A vote of thanks was tendered to Mr. Victor D. Horsburgh, the retiring chairman, who for the past two years has acted in that capacity, and to Mr. Secord, who is relinquishing the secretary-treasurership, for the very capable and efficient services which they have rendered during their term of office.

During the coming year an effort will be made to stimulate a still more widespread interest in the affairs of the Chapter. A programme committee has been appointed with Mr. A. E. Watson as chairman to provide a programme of subjects for discussion, and to arrange with speakers to address the luncheons and regular meetings.

Arrangements have also been made with the G.W.V.A. for the use of their club house for the proposed free architectural clinics to be conducted by the Chapter. The object is to assist such citizens building their own homes, who find themselves handicapped by not being in a position to pay for proper architectural advice, and to help in this manner to establish a better standard of small homes in the spirit of public service. It is felt that many men are capable of making their own drawings and will only require advice and guidance towards improving the appearance of the home and its arrangement. In addition, the Chapter is preparing to offer standard sets of working drawings, descriptive specifications and schedules of quantities for a nominal sum. The desire is to extend this service to all classes of the community, and clinics will be held in different parts of the city whenever there are sufficient applications for advice from either the returned soldiers or the citizens at large.

An important subject up for recent discussion by the Toronto Chapter was in reference to a statement appearing in the daily press, emanating from the Business Management of the Board of Education, and which brought into question the value of architectural services. In this connection the following letter was addressed to Mr. W. W. Pearse, Business Administrator of the School Board:

December 9th, 1920.

W. W. Pearse, Esq.,
Board of Education,
Toronto.
Dear Sir:

The newspapers this morning quote you as having stated that your department was effecting a saving of approximately fifty per cent. on the fees which would be charged by architects in private practice.

At the Chapter luncheon to-day this caused considerable comment and it was pointed out that unexplained statements of this sort, allowed to pass without comment, had in the past and were still doing much harm to the architectural profession at large.

As a result I was instructed to draw this matter to your attention, without in any way questioning the advisability of your department handling its own work.

Would it be possible for you in future public statements to make clear the different circumstances under

which your department works and avoid the inference of gross profits by architects in private practice.

Your truly,
Secretary, Toronto Chapter O.A.A.,
43 Victoria Street.

Mr. Pearse's reply to the above letter was as follows:

Toronto, Dec. 10, 1920.

H. F. Secord, Esq.,
Secretary Toronto Chapter O.A.A.
43 Victoria St., Toronto.
Dear Sir:

Your favor of December 9th received, in which I note what you say in reference to certain remarks which were made at the Property Committee about a saving of 50 per cent. on the architect's fees. I would be pleased if you would give the following facts to the Chapter at the next luncheon.

One of the trustees made an assertion that the Board of Education's Architectural Department was overmanned, and was costing more than outside architects could do the work for. I was therefore requested to furnish a statement, which resulted in it being pointed out that the saving was approximately 50 per cent. on what it would have cost if the work had been done by outside architects.

I am fully aware that this is not a good statement to have cast broadside, and I regret very much that it was necessary for me to turn in such a statement, but you can see for yourself that there was nothing else left for me to do in the matter. Naturally an organization like the draughting department of the Board of Education can have their draughtsmen transferred from one job to another and thereby keep them from wasting time, and thus reducing the carrying charge which architects are forced to bear, due to sometimes not having sufficient work to keep some of their principal men busy, and which they cannot afford to lose. Also the Board's charges are reduced due to the standardization of the schools.

If you will be good enough to give this statement to the Toronto Chapter, I am confident they will see the predicament I was in.

Yours truly,
(Signed) W. W. PEARSE,
Business Administrator and
Secretary-Treasurer.

MASTER PLASTERERS SUBMIT NEW PROPOSAL.

A proposal seeking a new arrangement in reference to the patching of plaster work in building in course of construction has been received and is at present being given consideration. The Master Plasterers contend that patching should not be included in the contract for new buildings. It is felt that any damage done by other trades should be adjusted afterwards, and before the building is finished. A committee is being appointed to meet with representatives of the Contracting Plasterers' Association to deal fully with the matter.

STANDARD BUILDING SIGNS FOR ARCHITECTS.

The Toronto Chapter has also sent a communication to the Council of the Ontario Association of Architects suggesting the use of a uniform sign by members of the O.A.A., with the recommendation that some standard device be adopted, and that members be encouraged to display same on all buildings erected under their supervision in order to acquaint the public with the fact that the work is being carried out by a registered architect.

The Advisory Council Draft Act

The Ontario Association of Architects have withdrawn from the scope of the bill to be presented by the engineering profession at the next session of the Ontario Legislature, the conclusion being reached that the architects' interests would best be served by securing independent legislation. Exception to the proposed act as drafted is taken on the following points:

1. Improbability of getting such an Act.
2. Unnecessary and objectionable to form another Association.
3. Difficulty of definition (Clause K, paragraph 2) is likely to interfere with successful operation of the Act.
4. Insufficient protection from outside practitioners, in that the practice of the province is not conserved for the development of the manhood of the province.
5. Power of Council as a whole to over-rule the representatives of its individual sections.

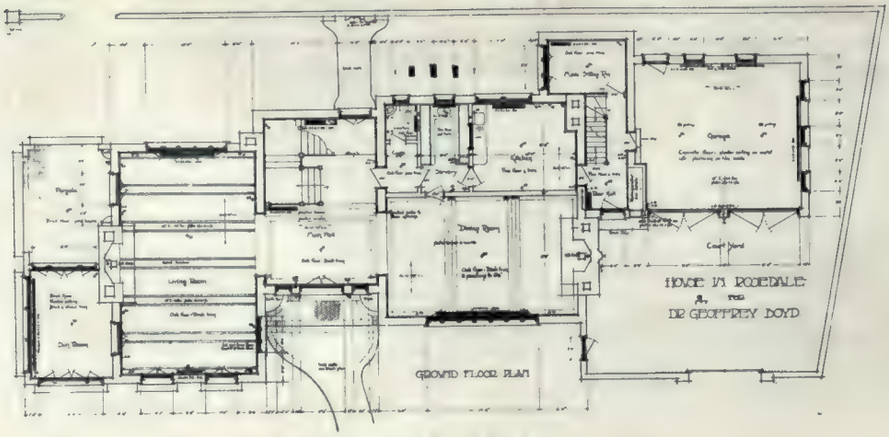
In presenting these objections to the Advisory Conference Committee, the Council states that the question of legislation for architecture has for a considerable time been receiving earnest attention, and that the Act as presented does not meet with the requirements of the profession, in that the essential thing for legislation to do for architecture is to give the profession a status, which its history and field of activity deserves. It is felt that this can best be done by the profession of architecture obtaining legislation as an individual profession and not in conjunction with any other body.

On this basis of separate action it was suggested that Clause "K," paragraph 2, be so amended as not to interfere with the practice of registered architects in Ontario.

This clause as originally drafted read as follows:

"The Practice of Professional Engineering and Architecture" means the advising on, the making of, measurements for, the laying out, the designing of, the supervising of, the construction of; the appraisal of; all private and public utilities, industrial works, railways, tramways, bridges, tunnels, highways, roads, canals, harbor works, harbors, light houses, river improvements, wet docks, dry docks, floating docks, dredges, cranes, drainage works, irrigation works, water works, water purification plants, seweage works, sewage disposal works, incinerators, hydraulic works, power transmission, steel, concrete and reinforced concrete structures, electric lighting systems, electric power plants, electric machinery, electric apparatus, telephone systems, telegraph systems, cables, wireless plant, mining machinery, mining development, mining operations, gas and oil development, smelters, refineries, metallurgical machinery, and equipment and apparatus for carrying out such operations, Machinery; steam engines, hydraulic turbines, pumps, internal combustion engines and other mechanical structures, chemical and metallurgical machinery and apparatus, aeroplanes, air ships, and all other engineering works.

MAIN ELEVATION.

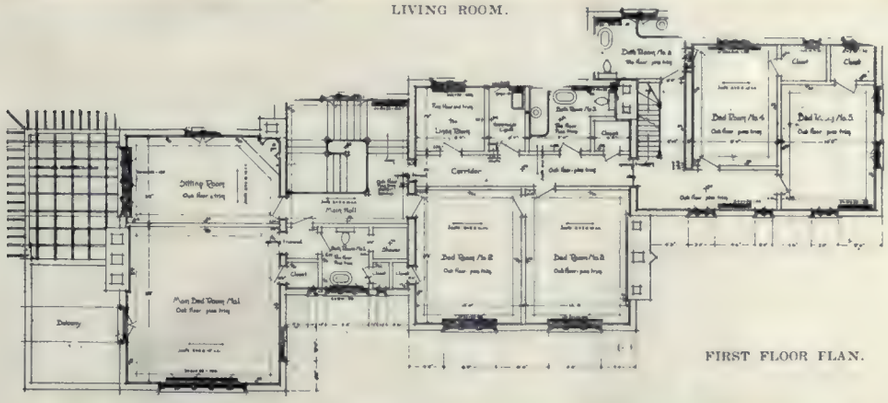


GROUND FLOOR PLAN.

HOUSE OF
DR. GEOFFREY BOYD,
TORONTO.

PAGE AND WARRINGTON,
ARCHITECTS.

LIVING ROOM.



FIRST FLOOR PLAN.

DINING ROOM.

HOUSE OF DR. GEOFFREY BOYD, TORONTO.

Recent Examples of Residential Work

THE house of Dr. Geoffrey Boyd, Rosedale Road, Toronto, illustrated in this issue, is beautifully situated among some very fine trees. The design is of a distinctly modern type reminiscent of the English country house. The exterior construction is of a rough, light cream colored, stucco on hollow tile with the foundation, sills, coping and chimneys of a dark red tapestry brick. The roof is of shingles stained in various shades of brown giving a mottled effect. An interesting feature seen in the photograph is the court-yard and wall giving access to the garage which is an integral part of the house.

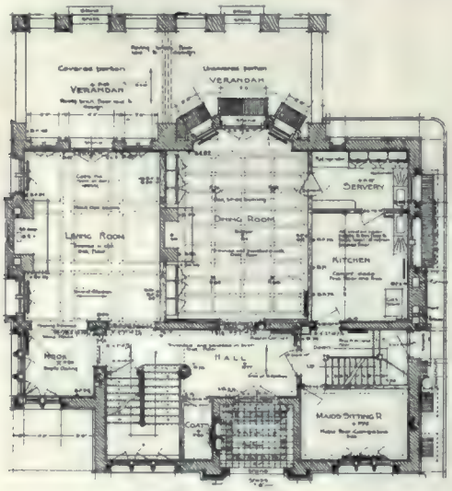
The living room is finished in mahogany with mahogany ceiling beams, mantel, and stone trimmed fireplace. The door seen to the left of the fireplace leads to a sunroom, while another door indicated on the plan, opens onto a stone paved pergola.

The dining room, of which a photograph is also shown, is panelled to the ceiling in walnut and has slightly decorated beams and moulding. The fireplace opening is faced with marble of a shade which blends in with the rather dark finish of the walnut. All fixtures and hardware are finished in dull silver. The room is lighted by a very large group of casement windows facing south, and under this window is a radiator cased in walnut with the top forming a wide sill. A concealed door giving access to the servery is an interesting feature.

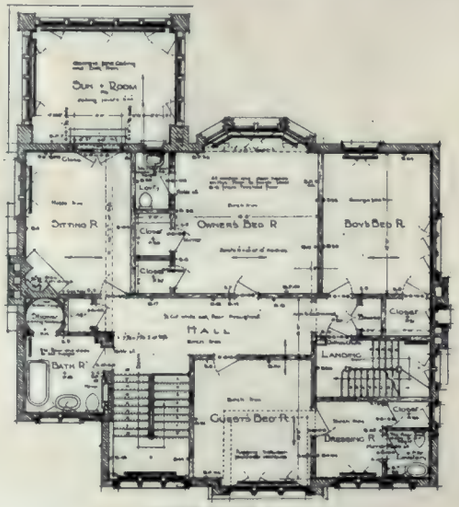
HOUSE ON JACKES AVENUE, TORONTO.

This house is constructed of red stock brick with stone trimmings and shingle roof. The house faces north and the plan shows that the main rooms were kept to the garden side of the house, where there is a very fine view over the city. The layout provides for a maximum accommodation with rooms of good dimensions, the general arrangement showing a well balanced and carefully studied scheme. A feature worthy of note is the compactly arranged closet space, and the service department on the ground floor. Both the living and dining rooms have beamed ceilings, and hardwood trim.

HOUSE ON JACKES AVENUE, TORONTO.



GROUND FLOOR PLAN.



UPPER FLOOR PLAN.

PAGE & WARRINGTON, ARCHITECTS.

Is "Cost-Plus" Justified?

In view of the large amount of discussion on the merits of the "cost plus" and "fixed fee" forms of contract, an article in the "Buffalo Live Wire," by H. E. Plumer, is not without interest. The author sets forth his opinion on the subject as follows:

IS "COST-PLUS" JUSTIFIED?

"Cost-plus" contracts (with the fee either a percentage or fixed sum) have contributed largely to the present high prices and unstable conditions of markets. While this form of contract did us a great service during the war by accomplishing marvelous results in a very short time, results that could never have been accomplished on the "lump sum" basis, at the same time some "cost-plus" contracts in the hands of selfish and short-sighted individuals did us infinite harm. Now that the war emergency is over we are not justified in continuing the evils of that system.

Let us look at the history of "cost-plus" contracts, study their faults and the dangers of their use. In pre-war times we can divide them into four classes:

1. Where the building operation required financing.
2. Emergency work.
3. Where no architect or engineer was employed.
4. Where the owner chose "cost-plus."

INFLUENCED FINANCING.

In the first case, where the operation required financing, we find the banking and loaning institutions, to protect their own interests, insisted that the building contracts be placed with responsible contractors. Then certain contracting concerns found it advantageous to have the officers of the loaning institutions as stockholders. This did not mean that these officers always used their influence for their contracting concern, but there are instances where an owner could only secure a loan from certain institutionss on the condition that the favored contractor secured the work on a "cost-plus" basis, which meant no competition. If the building overran the estimated cost the loaning institution did not advance more than the agreed amount, but the unfortunate owner had to get the rest as best he could.

EMERGENCY WORK.

In the second case, the emergency work, we find such instances as rebuilding after a fire or other catastrophe, of which rebuilding San Francisco is a notable example. The advantage is that work can be started before the plans are completed, thereby saving time. Contracts often have been drawn with no price guarantee, but a heavy penalty or bonus on time. This means the contractor was interested in making a bonus on the time clause and a record for himself, but had no incentive to keep down the cost. The result in San Francisco was that excess wages were paid and the cost overran the estimates until many an individual or concern was bankrupt. In other instances the owners have not realized they had paid a high price, while the trade was laughing at the "easy picking."

NO ARCHITECT OR ENGINEER.

In the third case, where no architect or engineer was employed, the owner may not have known a competent one who specialized in the kind of building he proposed to erect. He was attracted by the advertisement of some contractor and was persuaded by him to save the architect's fee by placing the contract with him direct.

COSTS UNDER-ESTIMATED.

In the fourth case, where the owner deliberately chose the "cost-plus" we find too often he was deceived by an estimate lower than any lump-sum bid with some apparent guarantee. One contractor admitted to me that he gave the owner an estimate lower than he knew the work would cost, and to make the estimate look bona fide he added a clause to the contract that he was to get a small percentage of the savings or to have his fee reduced the same small percentage of any overrun. He knew there would be an overrun, but he figured it would not take more than one-half of his percentage and he would still have a good contract.

WAR CODITIONS.

When the great emergency came, the war, contracts were given out with a heavy time penalty but no limitation to cost. The results were that almost all estimates were overrun and all too frequently the cost was twice the estimate, and instances can be cited where it was even more.

At the close of the war there was a shortage of many kinds of articles. Manufacture had been slowed down or completely stopped in many lines during the war and the country had been living on the store up supply or gone without. Manufacturers saw their opportunity and immediately started building to get ahead of the competitor. Again came the "cost-plus" with "time the essence of the contract." Contractors again offered higher wages, advertised and sent out scouts. Again the labor shortage was felt, again efficiency dropped till we have the present unstable price conditions.

To-day it looks as if we were passing the

peak of high prices. Business men are beginning to realize that while they were rushing to get ahead of their competitor, the competitor was also rushing to get ahead of them, and the only one who had been the gainer was the one who went slow. Conservative business principles are again coming in fashion. Efficiency is being demanded, prices will be stabilized, and then we will have an era of real prosperity.

COST-PLUS ON SUB-CONTRACTS.

The contractor is perhaps less to be blamed for the conditions he has helped to create than those who employed him. Many contractors have worked conscientiously to keep labor and material rates stable and only raised prices when forced to do so. They are co-operating to-day with other responsible business men to bring back stable conditions. Not all "cost-plus" contracts are bad, and there are conditions where they are advisable, but to adopt "cost-plus" as a standard for all contracts is bad business. The most convincing proof of which we have from the contractor himself as he will not sub-let any of the work except on a lump-sum basis.

Ontario Town Planning Conference

Under the distinguished patronage of the Lieutenant-Governor of Ontario, the Town Planning Associations of South Western Ontario and the Town Planning and Housing Association of Toronto are convening a Town Planning and Housing Conference to be held in Toronto on February 15th and 16th.

In connection therewith, the Commission of Conservation of Canada is arranging an exhibition to illustrate the progress in town planning and housing, particularly in Ontario.

The municipal councils of Ontario and the following organizations are invited to co-operate:

Town Planning Commissions.
Housing Commissions.
The Ontario Society of Architects.
Ontario Federation of Women Teachers.
The University of Toronto.
Ontario Branches, Engineering Institute of Canada.
Ontario Branches, Town Planning Institute of Canada.
Civic Guild of Toronto.
Ministerial Associations.
Ontario Motor League.
I.O.D.E.
Provincial Women's Institutes.
National Council of Women.
Home and School Council.
Association of Ontario Land Surveyors.
Ontario Medical Institute.
National Council for Prevention of Venerial Disease.
Good Roads Associations and Commissions.
Ontario Education Association.
Boards of Trade and Chambers of Commerce.
Canadian Manufacturers Association.
District Trades Councils.
G. W. V. A. Army & Navy G.A.N.V.
Federation for Community Service.

With reference to the above organizations, a strong appeal has been made for active co-operation in order that Ontario may keep abreast of other communities in the removal of conditions which impede progress in towns and cities. It is understood that a large number have already signified their intention of being represented, and the indications are that the congress will be the largest and most important of its kind yet held by any of the Canadian provinces.

A general committee with Mr. J. P. Hynes as chairman and Mr. W. S. B. Armstrong, secretary, is in charge of the various arrangements, and already an attractive tentative program has been prepared. Special efforts are being put forth to obtain the widest public interest and prominent speakers invited to address the conference will explain what phases of town planning may be accomplished under existing Ontario laws.

One of the main objects of the conference is to further new town planning legislation, which will probably come before the Ontario House this session, and this proposed legislation will be discussed at the conference. Housing and municipal finances are subjects also to be covered, and of local interest will be the afternoon devoted to the problems in planning "Greater Toronto." It is expected the sessions will be open to the public but there will probably be a special public evening meeting devoted to housing and town planning, which will be illustrated by moving pictures.

Draughtsmen to Form Atelier

At a meeting held on January 10, by Toronto draughtsmen it was decided to form a social club and to take up the offer which the Toronto Chapter of the O.A.A. has put forward regarding the establishment of an atelier. A committee was appointed to meet with the architects with a view to making final arrangements. About forty draughtsmen were in attendance.

Mural Painting

Mural painting has its own laws, and, like nature, they will not desert the heart that loves them. That which is so august in itself demands in the painter a discipline, even austerity, commensurate with it. In such way only, says the "Builder," London, will he reach the freedom to express himself, as by no means can he escape from the conditions of the work. And as mural painting offers the highest opportunity for the artist's powers so must he likewise offer the most exalted kind of service. It is the epic of painting, and he who would approach it must be furnished with some radiance of the divine fire. The conditions are hard, demanding the loss of ease and absence from comfortable studio conditions for the exacting terms of scaffold work and perhaps a draughty building, with little security from interruption and a tension growing out of the pressure lying in the demands of the work itself, and the necessity not to obstruct the building for a longer time than possible. Strange, in a sense, it is none the less true that these are amongst the most potent factors for the success of the work, in that they free the artist from himself. Nor is there any alternative; we cannot escape the claims that such work makes upon us any more than the soldier; and the painter, in approaching mural painting, places himself in the van of the arts, and through his example leads them.

On the other hand, to those deterred by these austere conditions there is the studio alternative. The work can be executed in strips, on canvas in the studio, to be afterwards joined together and stuck against the walls of the building it is to decorate. We do not reach the inspiration or requirements of mural painting in such a way. The studio alternative is the death of mural painting, replacing it by a kind of picture painting away from all the conditions that control the proper execution of both. For years this substitute has replaced the art of mural painting. Instead of the walls themselves furnishing the inspiration, they become an obstruction to be got rid of. Instead of growing out of the architecture—expressing and enriching it—it contradicts its forms. And it cannot be otherwise, mural painting being compelled from the first by its relations to the architecture, its conditions of lighting, and disposition, distance from the spectator, perspective, treatment, etc. Executed away from the building we have none of these conditions present to direct the work or to give it the required simplicity, force and breadth, so that its focus is inevitably miscalculated. For this loss there is no compensation other than the ease to take far too long over the work, because it is done in the wrong way. We shall, in the parts furthest from the spectator, find a great deal of wasted labor bearing no relation to the effect produced. The wings of its inspiration have drooped to the studio atmosphere, and the wall becomes subsequently the grave of the undertaking; and when in its place the impossibility of the method at once presents itself. It has dissolved the fabric of the walls contending against the architecture, which exists only to be an obstruction and mutilation to the painting. . . .

If the architectural student is to gain through his closer intimacy with the allied arts of painting, sculpture, etc., he must not be led into thinking that there ever was, or ever can be, any alternative or short cut by which the laws of mural painting can be evaded, or that the modern substitute offers any compensation for the loss suffered through this broken tradition. He cannot endorse in justice to the claims of architecture a practice which withstands the sounder craftsmanship which we feel to be so urgent. We have lived through an age of compromise and half beliefs, but are coming out of it, and we must reconstruct our craftsmanship to meet this new era.

Building Industries Association has Active Year

The annual report of Secretary Reilly of the Association of Canadian Building and Construction Industries, shows marked activity and substantial growth on the part of that organization during the past year. The membership drive inaugurated last August has brought very gratifying return and has resulted in a total added strength for the year of 436 members. Included in this increased membership are the Provincial Association of Ontario and Saskatchewan, and thirteen local construction organizations which have taken out collective memberships. Moreover, cordial relations have been established with other local bodies as well as with kindred societies in special branches of the building industry in different parts of Canada and organizations similar to the Canadian Association in the United States.

The secretary reports that the standing committee on standard practice has accomplished much towards the adoption of a standard form of contract which is being discussed at the Winnipeg conference. At this conference, which is at present in session, an effort will be made to accurately define the relations of the various sections and the policy of the association towards each during the coming year. It is felt that there should be a strong supply section with a joint secretary devoting his full time to its development, and that organization work should be extended to all centres where construction associations are weak or non-existent.

PORTAGE AVENUE BRANCH, WINNIPEG.
CANADIAN BANK OF COMMERCE
V. D. HORSBURGH, F. R. I. B. A., ARCHITECT.

Obituary

Mr. John Wickett, a well known contractor of Toronto, died at the Wellesley Hospital on January 5th, due to heart weakness following the effects of an operation. The deceased was associated with the firm of Wickett Brothers, Limited, who have been responsible for the execution of a large number of important contracts, including several of the more recent buildings erected at the Canadian National Exhibition, the Municipal Abattoir, and the St. Augustine's Seminary.

Recent Branches, Canadian Bank of Commerce

IN dealing with the several recent branches of the Canadian Bank of Commerce presented herewith, it is hardly possible to better describe the problems involved than to borrow from the "Caduceus," the monthly journal which the bank publishes for the benefit of its staff, in which most of these subjects have recently appeared. In doing this it might be of interest at the same time to mention that the Bank of Commerce maintains its own architectural department under the supervision of Mr. Victor D. Horsburgh, F.R.I.B.A., and that its policy has been one of marked expansion. This department is part of the Dominion Realty Company, a holding company which now own 257 buildings occupied by the bank, in addition to holding many choice sites for branches yet to be opened. The descriptive matter set forth therefore deals intimately with the subjects illustrated, and while plans are shown in only a few cases, the verbal account of the different buildings quite fully explains the essential features of the several schemes.

The first subject, the Portage Avenue branch, Winnipeg, represents the solution of an interesting problem in planning which the peculiarities of the site entailed. It was necessary to design a building of a character suitable for the important position it had to occupy, and to contrive an interior adequately lighted in spite of the fact that only one end was available for windows. The safety deposit business, too, required a prominent and accessible position, and the rear wall of the banking hall had to be removable for extension without involving any important feature, such as a vault or manager's room. These requirements located the vault at the front of the building, and, as the manager's room had also to be placed there in accordance with the bank's practice, and must communicate with the working space, the entrance to the banking hall had obviously to be to one side. The matter was further complicated by the fact that the main axis of the site is not at right angles to the street line. The solution finally adopted provided a graceful central portico, from which one passes through a circular vestibule at its eastern side, into the bank proper, the circular form of this vestibule effectively masking the oblique angle between the ffront wall and the main lines of the bank. Internally this obliquity is disguised by a double front wall and outer and inner windows, the outer and inner walls being several feet apart at one side but meeting at the other.

The building is lighted from the large arched window on Portage Avenue and a semi-circular cupola which forms a most effective feature of the interior. An extension to the rear can be carried out when required without interruption to the business which would be entailed had the front been devoted to a central entrance and the vault forced to the rear. The building as a whole is a notable and distinctive addition to the architecture of the city, giving as it does a logical expression of the strength and stability rightly associated with a successful banking institution, and at the same time possessing grace and refinement of a carefully studied architectural composition.

CANADIAN BANK OF COMMERCE, CHATHAM, ONT.
V. D. HORSBURGH, F. R. I. B. A., ARCHITECT.

THE STAFFORD-GROSVENOR AVE. BRANCH, WINNIPEG.

In the new branch at the corner of Stafford

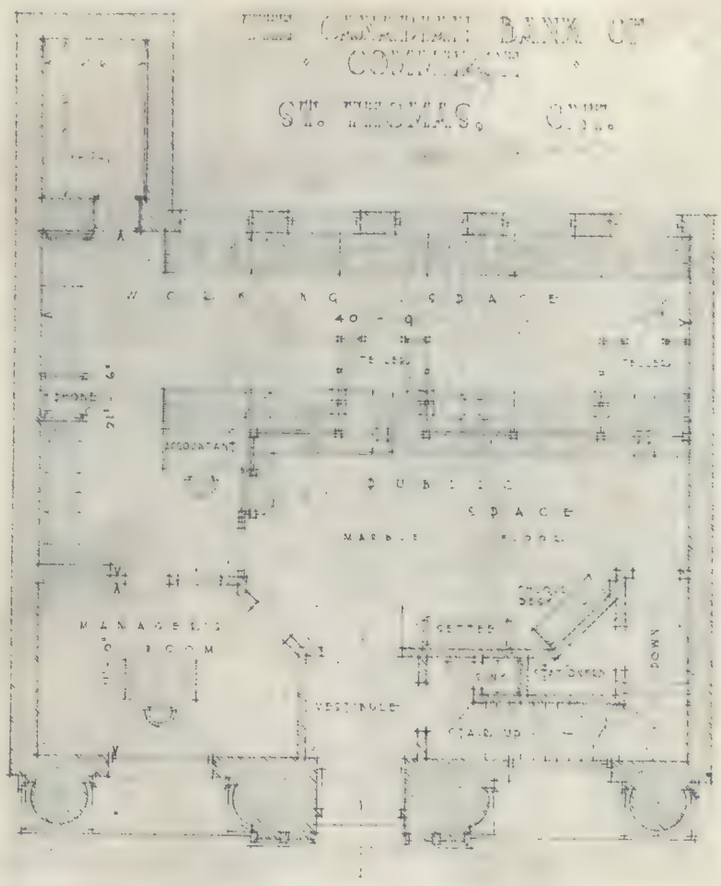
WINDSOR (ONT.) BRANCH.

ST. THOMAS (ONT.) BRANCH.

BRANCH BUILDINGS OF THE CANADIAN BANK OF COMMERCE

and Grosvenor Avenues, Winnipeg, the factors necessitating a high or large building were absent. In Winnipeg staff apartments are unnecessary, the suburban surroundings raise no question of rentable offices and the moderate size of the neighboring houses set no standard of height and mass. The question of design was therefore approached from the standpoint that the amenity of the locality should be respected and that, while the building should be unmistakably a bank and reasonably prominent, it should not dwarf its domestic neighbors nor introduce the jarring note of a commercial block in a purely residential locality. All these dangers have been avoided by the happy and natural division of the building into a central pavilion containing the banking hall and low wings containing the manager's room and the vault. The plan is one which in the event of a large business development can readily be extended rearwards without disturbing any department.

The character of the surrounding has also been respected in the material employed. The walls are faced with deep red sand-faced brick, the doorway and cornice are constructed in painted wood and the high pitch of the roof is covered with red Spanish tiles. The form of the roof over the banking hall resulted naturally in a high coved ceiling which has been moderately enriched and developed as the feature of the interior.



GROUND FLOOR PLAN, ST. THOMAS (ONT.) BRANCH.
CANADIAN BANK OF COMMERCE.

The bank has very few one-story buildings and this, the first of its particular type, is accordingly of special interest.

MONCTON (N.B.) BRANCH.

Conditions quite the reverse of the building just described obtained in the case of the branch at Moncton, New Brunswick, which is at a busy corner of the principal street, with valuable land to utilize and business buildings three or four stories in height as its immediate neighbors.

No attempt, however, was made to overtop or dominate the adjoining structures, but to design a building adequate to its situation and one not easily dwarfed by larger, and particularly by taller buildings. As the state of the building market and the bank's own policy, as well as the value of the land, dictated precision in planning, a capacity has been provided which allows a liberal but a carefully measured margin for expansion. Moderation in this respect has been justified by the successful arrangement of the banking hall in such form as leaves the way clear for unlimited expansion rearward. The entrance, manager's room, stair and vault have all been arranged towards the front and will not be disturbed by future building operations. The result is that an addition the full width of the lot can be built at the rear and, when complete, opened into the existing banking hall without depriving the staff of a single desk during the operations.

The corner entrance is the logical outgrowth of building on a site where two developed streets of almost equal importance intersect. Among the features of the plan is the division of the vault, by means of a steel grille, into an inner compartment for safety deposit boxes and the safe, and another compartment for the books. The wicket is placed close to the vault door which, as well as the examining booths, can be reached by a few steps by safety deposit customers without traversing any of the actual working space. The architect has also succeeded in devising a stenography department convenient to the manager and the accountant, but outside the main area of the banking hall.

WINDSOR, CHATHAM AND ST. THOMAS BRANCHES.

The branch at Windsor, Ont., has been previously illustrated, but the photograph shown at the time was quite unsatisfactory. The present

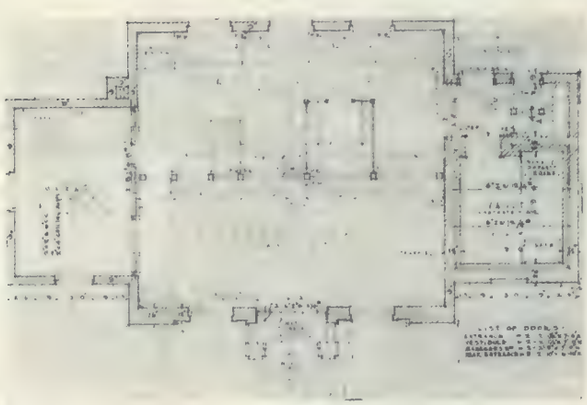
view gives a much better impression of the building. The restricted but valuable corner site, and the necessity for placing the entrance at the corner, led to the planning of an octagonal banking room with concentric counters. The building is of first-class fireproof construction, and contains in addition to the ordinary equipment of such branches, specially heavy vault doors and linings. It is also provided with a separate safety deposit vault, an electric elevator, and a blower ventilating system.

The Chatham and St. Thomas branches are two further examples showing diversified treatment in which the architectural design expresses the function of the building in a dignified and pleasing manner.

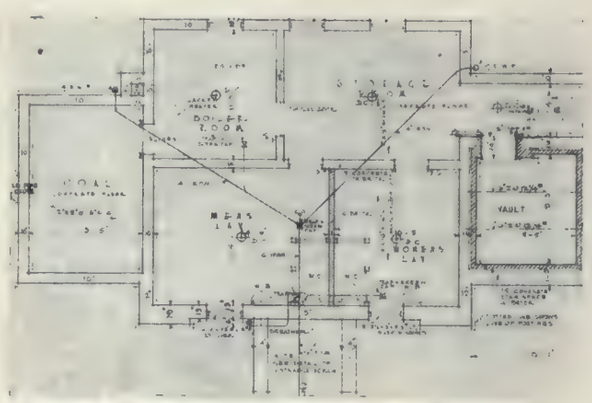
BRANCH AT STAFFORD AND GROSVENOR AVENUES

V. D. HORSBURGH, F. R. I. B. A. ARCHITECT.

CANADIAN BANK OF COMMERCE (RESIDENTIAL SECTION) WINNIPEG.



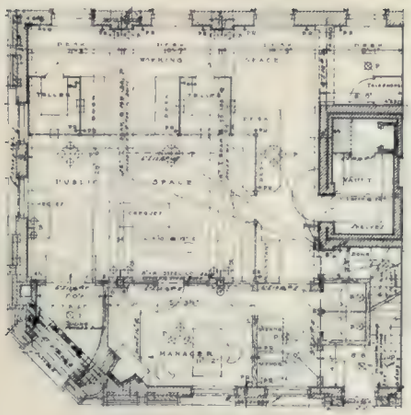
GROUND FLOOR PLAN.



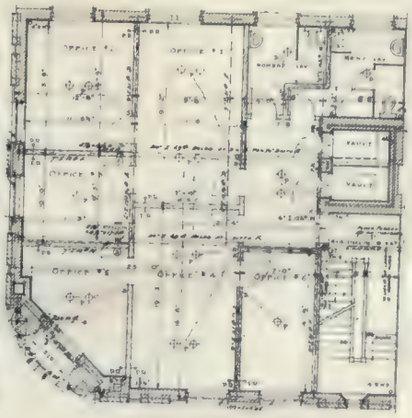
BASEMENT PLAN.

OTTAWA STREET AND CAMPBELL AVENUE BRANCH, HAMILTON, ONT.

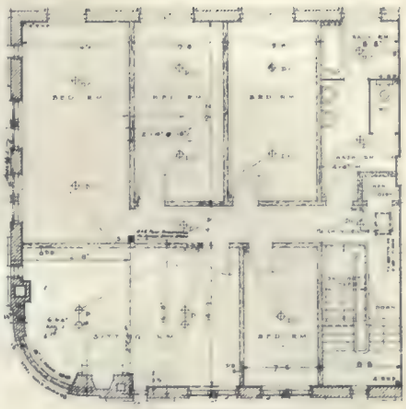
The branch at the corner of Ottawa Street and Campbell Avenue, Hamilton, Ont., is particularly interesting as an example of architectural reclamation. It was originally a store building which has been remodelled for banking purposes. While the Bank of Commerce is compelled in some case to occupy for considerable periods buildings originally planned as stores, it does not do so willingly. It is felt that a store, however good as such, makes a very bad branch bank. It is flooded with light and exposed to heat and cold by large display windows at one end and at the other end is usually dark and unventilated, owing to windowless walls required for stock shelves. In the case in point the store windows have been filled in, leaving normal windows for the manager's room, and windows towards the rear for the working part of the hall have been cut in the old wall. The length of the name "Canadian Bank of Commerce" and the bank's practice of displaying it on one line has a considerable influence in the design of its buildings. It forbids narrow central pavillions, and tends constantly towards the arrangement of a characteristic heavy entablature, in provid-



GROUND FLOOR PLAN.



SECOND FLOOR PLAN.



UPPER FLOOR PLAN.

ing the necessary fasciae or panels. At the Ottawa and Campbell Avenue branch the name is the main reason for the addition of the cornice, which, more than any other factor, accounts for the changed appearance of the building. Apart from the alterations mentioned and the necessary internal fittings and renovation of heating, wiring, plumbing and decoration, the original structure remains intact.

Chimney Two Miles Long

The tallest chimney in the world is in Wales, and is over two miles in length, and has a further distinction in that it has a brook running through it. According to a contemporary, it was built by a smelting company after the neighbors for miles around the plant had complained that unless something was done to alter the drift of copper smoke that destroyed vegetation and rotted the hoofs of farm animals, they would take the plant away brick by brick.

A famous engineer was called in, and after inspection of the plant began a chimney that extended from the roof of the plant up a mountain side just back of the works. The chimney, in addition to crawling the two miles up the mountain, extends 100 feet up in the air. The brook was allowed to flow almost the entire length of the chimney, as it was found the running water would condense the smoke to a great extent. Once a year the chimney is swept, and a ton of precipitated copper is reclaimed. The tip of the smoking chimney can be seen for forty or fifty miles on a clear day.

CANADIAN BANK OF COMMERCE, MONCTON, N.B.
V. D. HORSBURGH, F. R. I. B. A., ARCHITECT.

BRANCH OF CANADIAN BANK OF COMMERCE, OTTAWA STREET AND CAMPBELL AVENUE, HAMILTON, ONT., BEFORE AND AFTER ALTERATIONS.

V. D. HORSBURGH, F. R. I. B. A., ARCHITECT.

Lands for Public Purposes

By Thomas Adams.

Reprinted from "Town Planning and Conservation of Life."

It is frequently found that governments and local authorities have to pay high prices for land required for public purposes. In many cases these prices are enormously in excess of the assessed value of the land. As the assessed value is or should be the "fair market value," and as the public revenues are based on that value, it should have a definite relation to the purchase value for public purposes.

It is possible that in some cases the disparity between the assessed value and the purchase price is due to under assessment; but whichever may be the reason for the difference, the public purse has to suffer. Even when a local authority pays a high price for land, it has no cause for complaint if its taxes are based on an assessed value approximating to that price. The grievance is that the revenues suffer at one end by low assessments and at the other end by high prices for the thing which has enjoyed the low assessment.

It is difficult to find any remedy for this condition, because it is almost impossible to get accurate assessed values, and the natural tendency of owners is to keep down the assessments and to get a high price when they sell.

There is need for some compulsory measure to secure, first, that owners declare the real value of their land, and, secondly, that they be made to accept a price which is approximate to that value when the land is wanted for public purposes. By public purposes is meant such purposes as parks, playgrounds, street widening, hospitals and schools, and housing schemes carried out by municipalities or housing societies.

The purchase value has frequently no relation to the assessed value. There are farm lands in Ontario assessed at $41.50 per acre having an approximate market value of $1,000 per acre. The absurdity of the assessed values is shown in one district of Ontario, where a building and site are assessed by one municipality at $78,000 and by another municipality at $5,000, both figures being sworn to under the same Assessment Act requiring a fair value to be determined.

There does not appear to be any better way to solve this problem than what has been known as the "tax and buy" method, which has been carried out in other dominions. There should be legislation enabling land to be acquired for any public purpose at the assessed value, plus say 25 per cent. for compulsory purchase. In addition to the price to be paid for the bare land, however, there should be provision that payment will be made for the actual cost, plus compound interest, of any improvements carried out by the owner of the land within a stated time prior to the purchase, say 10 years. There should also be provision that if any part of the land is in use for any purpose of trade or industry, compensation should be paid for injury,

to be determined by arbitration in case of a difference.

FINANCING LOCAL IMPROVEMENTS.

The practice followed in the United States and Canada of constructing local improvements at the cost of the municipality to encourage settlement has been carried on long after it has served a useful function, until now it is endangering the financial stability of our cities, with the sole advantage of enriching the speculator. This applies whether the municipality recovers the expenditure on local improvement taxes or not. The element of speculation enters into the city's expenditure for local improvements, and the city speculates more freely when it has the power of recovering that expenditure from the users of the land.

Why should cities and towns finance land speculation any more than industrial speculation? It is not done in older countries, and is being abandoned in many progressive cities in the United States.

TOWN PLANNING A NECESSARY PRELIMINARY.

Cities and towns should definitely prescribe the part of their area within which they will complete local improvements already begun or continue to construct new local improvements under the method hitherto followed. This area might be limited to the land within a boundary fixed by half a mile of the street railway within the city, or other agreed boundary. Until this area is fixed it cannot easily stop the present process of financing local improvements.

Having determined the area within which they will continue the former practice, and having kept that as small as possible, it will next be necessary to lay down the principles on which local improvements may be carried on outside the area so prescribed. This would include areas likely to be annexed in future. The correct principle is to place the burden of the cost of such part of the improvements on the owners as is necessary for the purpose of the development of their land for building, leaving to be paid by th community the part of the cost that is of general public benefit.

WHAT SHOULD THE OWNER DO?

The owner at present give the land necessary for the streets and makes such improvements as he thinks necessary to sell his land, and the question is what he should be made to do in addition to that. He should construct such pavements and sidewalks as will provide dry and convenient access to the lots and such sewers and drains as are necessary for proper sanitation. He should make the pavement with a proper foundation and a temporary surface of waterbound macadam according to a specification of the local authority.

The water-main being a revenue-producing service would not have to be paid for but should, of course, be provided in advance of building.

The completion of the pavement, either with a bituminous surface or by reconstructing it with asphalt or concrete, would be a proper charge to assess against the frontagers (i.e., residents) in the street. If the original subdivider carried out a greater share of the improvements in the way above suggested, it would lessen the difficulty of the occupant frontagers in having to meet the cost of the permanent improvements of the street.

In England the entire cost of new street work, including sewers, other than the improvement of existing highways and the construction of trunk sewers, is borne by the owners of the land. Owing to the fact that the local authorities in England do not advance money to the owners to carry out these local improvements, and owing to the requirements of the by-laws, the practice is for real estate operators to construct most of the local improvements at their own expense. One finds little land built on in the suburbs of English cities that is not served with good pavements, sewers and water-mains, and in most cases these have been provided simultaneously with or prior to building. Undoubtedly similar methods will secure similar results in Canada.

The fact that the English city puts the chief burden of constructing local improvements on owners of the land is probably the chief reason why the cost of administration in the English city is so much lower than in the American and Canadian city. According to the *Municipal Year Book*, the average municipal taxes paid in England amount to $9.75 per capita, whereas in one Canadian city the burden is shown to be $50 per capita of the population of the city. Unquestionably one of the chief causes of this almost ruinous condition is due to the extent to which local improvements have been financed.

SUMMARY OF APPORTIONMENT.

The apportionment of the responsibility for cost of construction between the three parties concerned might be summarized as follows:

Class (1) *City Share.*—(a) Main trunk sewers.

(b) Excess of cost of intersecting sewers over and above the cost of sewer necessary for developing the land.

(c) Excess of cost of land, and construction of any street or highway wider than 66 ft.; such excess to be the difference between the cost of a street 66 ft. wide and the cost of a street of a greater width required by the municipality.

(d) Such public services as water-mains, electricity, etc., as are revenue-producing.

(e) Taking over and maintenance of high-

ways when completed to an agreed *ultimate** standard in the third classification below.

Class (2) *Subdividing Land Owners.*—(a) Formation and grading of streets as hitherto.

(b) Construction of macadam pavements, temporary or permanent sidewalks, curbs, channels, surface drainage and sewer in accordance with plans, sections and specifications of local authority up to a *primary* standard necessary to provide dry and convenient means of access to any buildings, and the planting of trees.

Class (3) *Purchasers of Lots and Residential Owners.*—(a) Completion of surface of pavement to *ultimate** standard by adding surface coating of bituminous material, or, on petition of the property owners, the substitution of asphalt or concrete for macadam.

(b) Substitution of the temporary sidewalk of timber or gravel by a permanent concrete sidewalk if and when desired and the original owner has not constructed the concrete sidewalk.

The cost of the works in the classification (2) ought to be left to be paid for by the building speculator or sub-dividing land owners and the city should not finance such work. The only case in which local improvement taxes should be introduced is to help residential and tax-paying owners to complete the street according to what is called the "ultimate" section in class (3).

The advantage of the above proposals as a means of stopping injurious speculation as compared with any method of introducing higher taxes on land is that they secure the object desired in a more direct way and to the greater advantage of the community.

To get this advantage, however, it is desirable that town planning schemes should be prepared. In the connection discussed in this article, town planning is needed partly for the purpose of providing the basis necessary to plan and define the areas within which the present practice would continue to be followed. This is desirable so as not to make an immediate break with existing conditions and so as to avoid causing injury to private property, in those cases where expenditure has already been incurred under present methods.

Town planning is also needed to enable the width of the streets to be determined in relation to the use to which the land is to be put so that owners can construct their portion of the local improvements at a reasonable cost.

The effects of town planning in reducing excessive values of land but in stabilizing the investment properties of land, have been apparent where schemes have been prepared. If the number of houses that can be erected on the land is limited under a scheme the land becomes thereby reduced in value, as a rule. But this reduction merely arises from destroying the value which accrued from an unhealthy use or density of building on the land. Thus the effect of town planning is to cut down that portion of the value of land which is created by the bad use. The values which accrue from central locations or fine views not only continue to be realizable, but will be more secure because of the restrictions on bad use. If we add to town planning the power to local authorities to acquire land as proposed in this article at the reasonably fixed percentage over the assessed value, and also the requirement that owners of lands to be subdivided in future shall themselves construct or finance their local improvements up to a certain *primary* standard, we shall by these three measures go a long way to solve the land question.

These operations would be more beneficial to a city than imposing excessive taxation, which may have the effect of punishing the owner for bad development.

* The city engineer would prepare two sets of drawings showing first, *primary* sections, plans and specifications to fall in with requirements of Class (2), and second *ultimate* sections, plans and specifications to be completed as required for Class (3).

Joint Industrial Board Discusses Apprenticeship

A system of apprenticeship for the building trades of Canada, based on progressive lines, was discussed by the National Joint Industrial Board of the Building and Allied Trades at a meeting held in Montreal on January 4th. The scheme as outlined provides for the establishment of a national apprenticeship council which will act in an advisory and supervisory capacity, with the object of issuing forms of indenture for each branch of the industry and of placing apprentices with firms who will engage to give them the fullest opportunity of efficiently learning a trade. The subject is one which has been quite generally discussed for some time past, and an effort will be made to reduce it to practical results.

An Electrically-Welded Roof

A large factory building was recently constructed in London on an electric welding system similar to that by which the first rivetless vessel was constructed by the British Admiralty during the war. No rivets are used in the structure, all the joints being made either on the ground before erection or when the parts are brought into position. This method lends itself to very rapid construction by a smaller number of hands than is necessary when riveting is employed. Another advantage lies in the reduced amount of steel required for a roof designed to sustain a particular weight. The system of welding adopted has been devised to give reliable results even when the work is carried out by men with a moderate amount of training.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor
W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street.
C. S. Soutter, Representative.
WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
F. Watson, Representative.
CHICAGO—608 Otis Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada

Vol. XIII. Toronto, Jan. 1921 No. 1

Ontario Engineers' Draft Bill on Legislation

At the next session of the Ontario Legislature an effort will be made to secure legislation regulating the control of engineering practice in the province. The draft act on which the Advisory Committee on Engineering Legislation have been working the past several months, and which is now being considered by the various engineering branches prior to its presentation, will in the event of its enactment affect civil, mechanical, electrical, chemical and mining engineers practicing in the province.

The main features of the bill as summarized by its promoters are as follows:

"1. It follows closely along the lines of legislation already enacted in the Provinces of British Columbia, Alberta, Manitoba, Quebec, New Brunswick and Nova Scotia. For this reason reciprocal privileges between these provinces and our own should be much easier than if our legislation were on radically different lines.

"2. It places the control of engineering in the hands of the profession itself, thereby avoiding control by Government officials who may lack full understanding of our diversified needs.

"3. The Government will have a share in choosing the personnel of the Council, thus providing a guarantee that the Council cannot be controlled by any particular group.

"4. The different branches of engineering are given equal representation, so that no one branch can gain control.

"5. The branches are made partially autonomous, so that their regulations may vary from one another in matters requiring such variation. At the same time the Council has power to prevent these variations becoming too extreme.

"6. The legislation is intended to cover engineering only. Technical trades and similar occupation cannot be brought within its scope. It is only by remaining distinct from these that engineering can attain full professional status.

"7. Provisions for registration of present practicing engineers are made reasonably broad, so that nobody with fair pretentions will be debarred from his present livelihood.

"The Committee feels that these features should prove acceptable to every professional engineer in Ontario. Other styles of legislation may have points in their favor, but the above considerations were considered to be of more importance."

If enacted, the Act will create an association of engineers which appoints two-thirds of a council, while the Provincial Government appoints one-third. The council will have full control of examinations and registration, and only those who can meet the prescribed qualifications and register will be allowed to practice in the province.

While precedent for closing the profession such as the wording of the draft bill implies, may be found in the acts granted to the legal and medical professions, subsequent attempts to secure legislation in Ontario along similar lines have totally failed. The essential difference between the two is that the engineers' Act as proposed provides for an appeal to the High Court of Ontario in case of suspension or expulsion, or in the event of the council refusing to register any applicant for membership in the association .

The experience of the architectural profession, however, has been that legislation of this character has been difficult to obtain, and their efforts in this direction have received very little encouragement. Because of this, as well as the fact that it is felt that it does meet their requirements, the Ontario Association of Architects, which was represented on the Advisory Committee during the drafting of the Act, have withdrawn from the scope of the bill, the con-

clusion being reached that their interests would best be served by securing independent legislation. The desire of the latter is to promote legislation which will fully conserve the opportunities for technical practice and develop the manhood resources of the Province, similar to the Illinois Act, and which at the same time will place the matter of examination and registration under the Department of Education and make the latter solely responsible for the administration of the Act.

The New Draftsmen's Association

A meeting of draftsmen, union and non-union, was held in the city of Toronto on November 26th last, and after an expression of views from all present, it was decided that a professional organization in the form of a Draftsmen's Association should be formed. A provisional committee of F. C. Hague Maundrell of the Canadian Allis-Chalmers Company, C. S. Lennox of the Fletcher Manufacturing Company, R. McD. Symonds of the City Architects' Department, W. B. Hackett and L. S. Van Raalte of Horwood & White's office, was appointed to organize a preliminary meeting, which was held January 10th.

In the interval the Toronto Chapter of the Ontario Association of Architects made a tentative proposal that an "Atelia" be formed. Mr. R. K. Sheppard and Mr. C. S. Cobb enthusiastically brought the matter to the attention of the provisional committee and promised to give their personal services to the association if the project was carried into effect. With this attractive proposition, the task of the provisional committee in getting the architectural draftsmen to attend the first meeting was very much lightened, and, it was decided by the committee that some endeavor should be made to obtain a somewhat similar offer from the employers of mechanical draftsmen. The heads of some of the larger organizations in the city were approached, but, while every encouragement was offered the committee, no definite promises were made.

About forty draftsmen attended the association's first meeting at the Peacock Inn. Mr. Van Raalte opened the meeting with a short address, outlining the aims and purposes of the association. He pointed out that, in the past, such associations had failed because they catered to interests of doubtful importance or their objects were not practicable and liable to cause antagonism between the employer and the employee. Projects were also sometimes organized from outside; withdrawal of such external support causing collapse. He emphasized the importance of establishing social and athletic as well as educational features to retain the interest of all members, and spoke against the union ideas of fixed minimum and maximum salaries and the grading of draftsmen, advising that these subjects be excluded from the association.

The objects of the association are to promote and maintain the general welfare of its members by social, recreative and educational work and to bring draftsmen together in one friendly organization without antagonism to any other organization or class.

The report of the provisional committee was adopted and provisional officers were elected for a period of 60 days or until such time as the general election of officers could be held.

R. Goodman of the City Architect's Department is president, C. S. Lennox, vice-president; W. B. Hackett, recording secretary, and R. McD. Symonds financial secretary and treasurer. These with S. Van Raalte, J. L. Beattie of Stevens & Lees office, and T. H. Lowrey of Harwood & White's office, form the executive committee.

A temporary scale of membership dues was agreed upon and thirty of those present indicated their appreciation of the new association by at once handing in their subscriptions.

Committees were appointed to arrange for the "Atelia" and educational work.

A smoker and card party will be held in the near future to which every draftsman is invited. Tickets will be available from any member of the executive committee after the 24th of January.

The meetings of the associations will be held on the first Monday and the third Tuesday in each month at 8 o'clock. The next few meetings will be held at the Peacock Inn, and it is hoped that permanent quarters will be located soon.

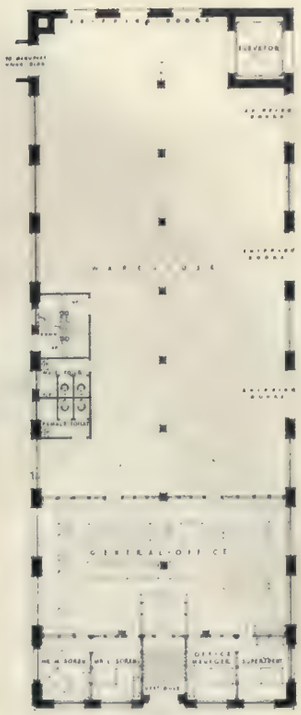
Architectural draftsmen who are interested in the "Atelia" are requested to get in touch with Mr. Hackett. Mechanical and structural draftsmen are invited to become members of the association in order that educational features may be arranged.

The association is particularly desirous of obtaining the membership of those who are willing to devote some time to educational work for the younger members.

Stratford Exchange Elects Officers

The Stratford Builders' Exchange has elected the following officers for the ensuing year: President, R. Marson; first vice-president, J. Keyes; second vice-president, A. G. Garner; secretary-treasurer, F. Scott; directors, Lieut. Col. J. L. Young, D. Easson, J. M. Lillow, E. E. Leischauser and C. Myers; auditors, F. Ingram and H. McLeod. Arrangements are at present being made for the provincial convention of contractors and supply men to be held in Stratford on February 15, 16 and 17.

SOREN BROS.' WAREHOUSE, TORONTO. HAROLD S. KAPLAN, ARCHITECT.



MAIN FLOOR PLAN.

Soren Bros. Warehouse, Toronto

The new building of Soren Bros. on Van Horne Avenue, Toronto, has been made necessary owing to increasing business, and is used mainly as an office and warehouse. It has a frontage of 50 feet by a depth of 132 feet, and is connected to two adjoining buildings used for manufacturing purposes in the production of tinware.

The facing of rug brick and the use of stone trimmings give a more pleasing facade than is usually obtained in this class of building. The offices are trimmed in Georgia pine, finished natural, and of a very practical character for the purpose intended.

The building is of mill construction, the walls brick, and the floors are four-inch solid with maple finish. The columns and beams are of British Columbia fir, the wide column spacing and the large steel windows resulting in a roomy and well lighted interior, which is in contrast to the ordinary small warehouse building.

Direct shipping facilities are provided at the rear, where a private siding is brought in from the main railway line. The first floor level is on the same level as the floor of the cars, and the large freight elevator at the rear is convenient to the loading platform. The side doors opening on the lane are for city delivery.

The heating is done by a steam vacuum system connecting with a boiler in the power plant, the heating mains being brought in through an underground conduit.

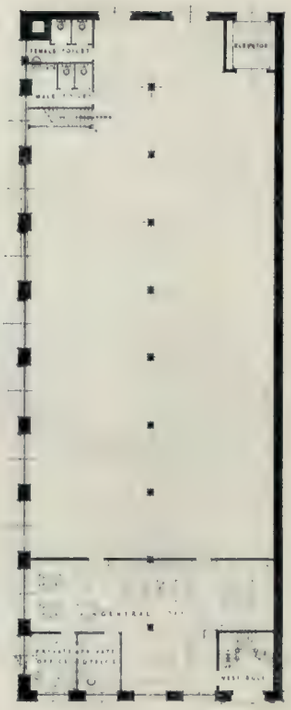
The warehouse of the Fielder Paper Box Co., Toronto, also illustrated, is similar to type, accommodation and construction, and is interesting as showing the degree of individuality which can be given to buildings of like character by the use of slightly different materials and treatment as to detail.

University Lectures on Town Planning

The Commission of Conservation has arranged with Canadian universities for courses of lectures during the current session by its expert advisers on town planning and housing, and on water-powers and hydro-electric and allied problems. Those on town planning and housing will be delivered chiefly by the Commission's expert adviser, Mr. Thomas Adams, and will include lectures at McGill, Toronto, Manitoba, Saskatchewan, Alberta, British Columbia, Dalhousie, Acadia and Fredericton universities. The lectures on water-powers and hydro-electric and allied problems will be given by the Commission's engineer, Mr. Arthur V. White, who is recognized as one of the highest authorities on Canada's fuel problem and on the development of the water-powers of the St. Lawrence, Niagara and other great power rivers of Canada.

The most extensive series of town planning and housing lectures will be delivered at McGill during the second term, between January and April. Lectures will also be given on housing under the Department of Social Service, at McGill and Toronto. This is a forward step in university teaching, and is in accordance with

FULLER PAPER BOX COMPANY'S WAREHOUSE, TORONTO. HAROLD S. KAPLAN, ARCHITECT.



MAIN FLOOR PLAN.

the fixed policy of the Commission of Conservation to utilize the services of its expert staff in the most effective manner. During the past eleven years, they have been investigating Canada's natural resources. The Commission is now in a position to make recommendations of the highest value respecting the problems associated with their efficient development and to furnish accurate data respecting their character and extent.

Changes Firm's Name

The firm of Slater & Barnard, Hamilton, Ont., manufacturers of hangers, hinges and builders' hardware, will hereafter be known as the N. Slater Company, Ltd., supplementary letters patent authorizing this change having recently been granted by the Secretary of State, Ottawa.

The company has recently issued a revised catalogue illustrating and listing its complete line of hinges, fire door fixtures and hardware specialties, which will be mailed to interested parties upon request.

Roof Flashing Handbook

Architects and engineers who are familiar with the merits of the "Barrett Specification," will undoubtedly be glad to know that the Barrett Company has gone a step further and applied its engineering skill to the solution of another big roofing problem—that of providing reliable standard flashings. The results of its efforts in this direction is fully described in a booklet available to interested parties, which treats of flashing methods devised by the company to secure a maximum watertight service and overcome difficulties which have hitherto existed. The booklet contains in all 48 pages of data relating to the subject in question, together with illustrations and blue prints which make it of utmost practical value.

CONSTRUCTION desires to acknowledge the receipt of a 1921 vest pocket diary which is being mailed to the trade by the Canadian Westinghouse Company, Hamilton, Ont. In addition to space available for daily notations, it contains much useful information and data on weights and measures, belting, wiring, pulley and gears, motors, turbine and condensers, mechanical stokers, generators, railing motor ratings, etc.

A very useful wall calendar is being mailed to its customers by the Canadian Ice Machine Company. It is of practical size for everyday office use, being printed in large, readable type and figures, with a halftone view of the "Cimco" plant, and a list of the ice making machinery and refrigerating equipment and products in which the company specializes.

Sadler & Howarth, tanners and manufacturers in oak leather belting, with offices in Toronto, Montreal, St. John, Winnipeg and Vancouver, are mailing out a large wall calendar suitable for office and industrial uses. Space is provided in connection with each date space for memos or daily reminders, and the signs of the Zodiac are aptly employed to draw attention to the advantages of "Amphia" and "Climax" waterproof belting.

Toronto, February, 1921 Vol. XIV., No. 2

CONTENTS

ALTAR AND REREDOS, CHURCH OF ST. JOHN THE EVANGELIST, HAMILTON, ONT. 35

NORWAY PRIMARY SCHOOL, TORONTO 39

WINNIPEG BUILDING CONFERENCE 42

OUTLOOK FOR CONSTRUCTION WORK 43
Address of President J. Penrose Anglin, before the Winnipeg Conference of the Association of Canadian Building and Construction Industries.

DRUMMOND APARTMENTS, MONTREAL 45

EVOLUTION OF ARCHITECTURE 49
By G. H. MacDonald, B.Arch.

ECONOMICS OF BUILDING DESIGN 54
By J. Morrow Oxley, A.M.E.I.C.

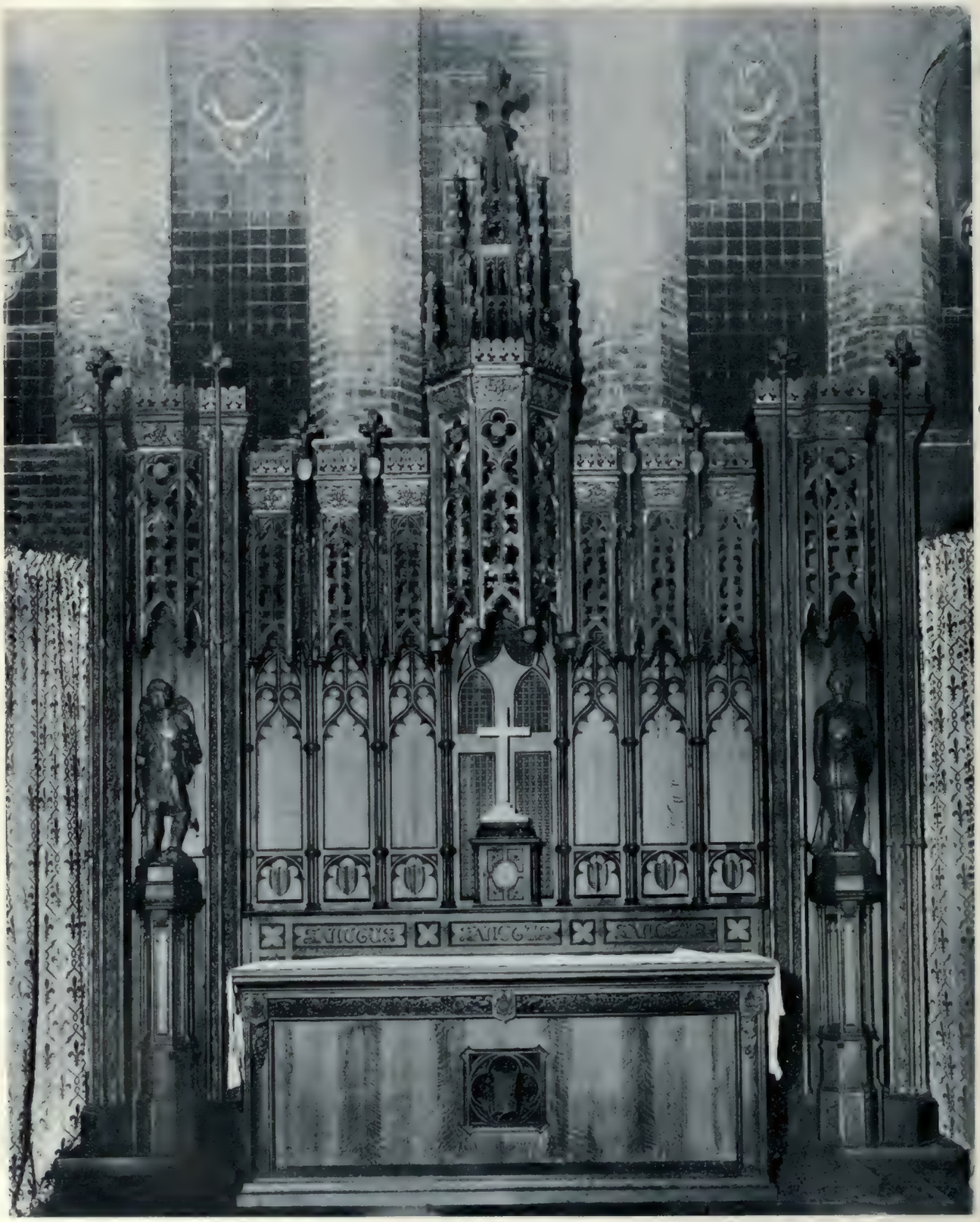
O. A. A. NOTES 61

EDITORIAL 63
Ontario Town Planning Conference.

Full Page Illustrations

ALTAR AND REREDOS, CHURCH OF ST. JOHN THE EVANGELIST, HAMILTON, ONT. 34

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



CARVED OAK REREDOS AND ALTAR.

CHURCH OF ST. JOHN THE EVANGELIST, HAMILTON, ONTARIO.

Altar and Reredos in Hamilton Church

A VERY noteworthy example of the wood carver's art in the form of an altar and reredos, has recently been installed in the Church of St. John the Evangelist, Hamilton, Ontario, in memory of the two sons of the Reverend Canon Daw, the late rector of the parish, and of their cousin, A. G. Fraser, who made the supreme sacrifice while serving the Empire in the Great War.

The altar is chaste and simple in design, the wide expanse of the front being relieved only by an exquisitely carved panel in the centre and the natural beauty of the oak grain. This treatment emphasizes the richness of the reredos with its wealth of decorative detail. The cornice is enriched by running foliage with the inscription "To the Glory of God" interwoven. At each corner and in the centre of the cornice is a shield with the crests of the 21st, the 58th and the Worcestershire Regiments carved in relief, representing the units in which those whose memory is being perpetuated saw service.

UPPER CANOPY OF SIDE TOWERS.

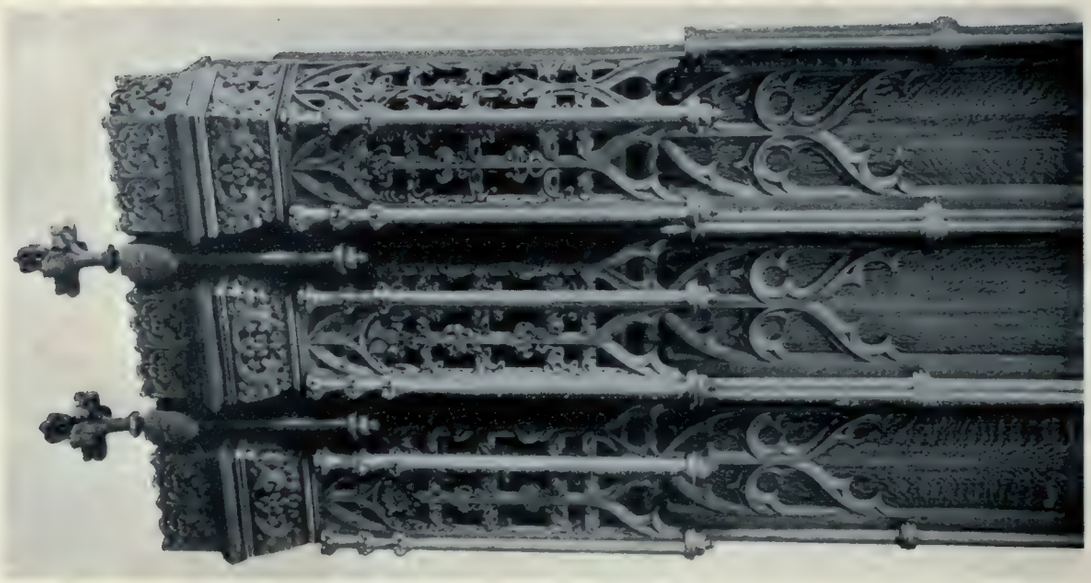
The detail of the ornament of the central panel is particularly fine. An elegantly carved shield with the I.H.S. emblem cut in relief is enclosed in a quarterfoil which in turn is contained in a circle within a square. Within the quarterfoil and surrounding the shield are carved the Rose, Thistle, Shamrock and Maple Leaf in natural foliage. In the end panel of the altar is engraved the names of the fallen heroes, cut deeply in the solid oak. The altar is 9 ft. in length, 2 ft. 6 in. in depth and 3 ft. 3 in. high. It stands clear of the reredos, a space of two feet being allowed for passage between.

DETAIL OF ALTAR.

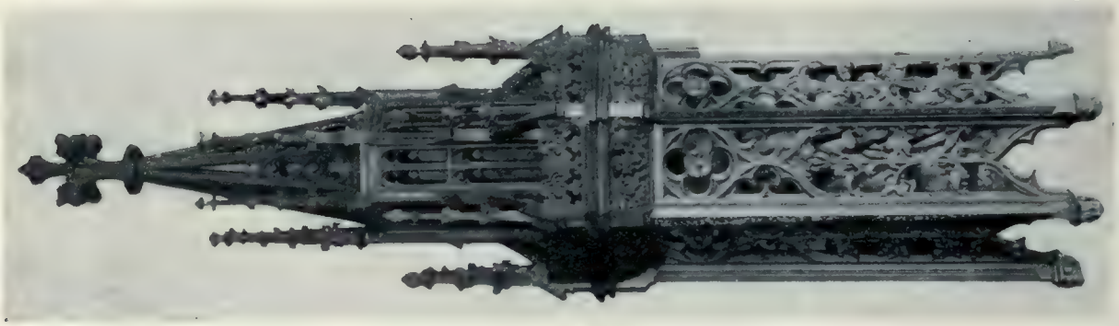
The design of the reredos in general follows the fifteenth century perpendicular Gothic, the principal feature being a central canopy with spire, the finial of which rises 20 feet from the floor of the Sanctuary, and two well-proportioned side towers which form niches for the figures of the militant saints, St. George and St. Michael.

These towers are connected to the central canopy by a series of smaller canopies, three at each side. An enriched cornice and carved and perforated cresting surmounts all the towers and canopies with small carved finials placed at intervals. The background is enriched by tracery panels, the lower portion of which forms a series of arches each enclosing a shield. Upon the gradine or retable are the words "Sanctus, Sanctus, Sanctus," each letter of which is finely modelled and carved in relief. A small but exquisite tabernacle has been introduced in front of the centre panel, which supports a cross. The tabernacle was removed from the old altar and incorporated into the design, it having been presented to the church some time ago.

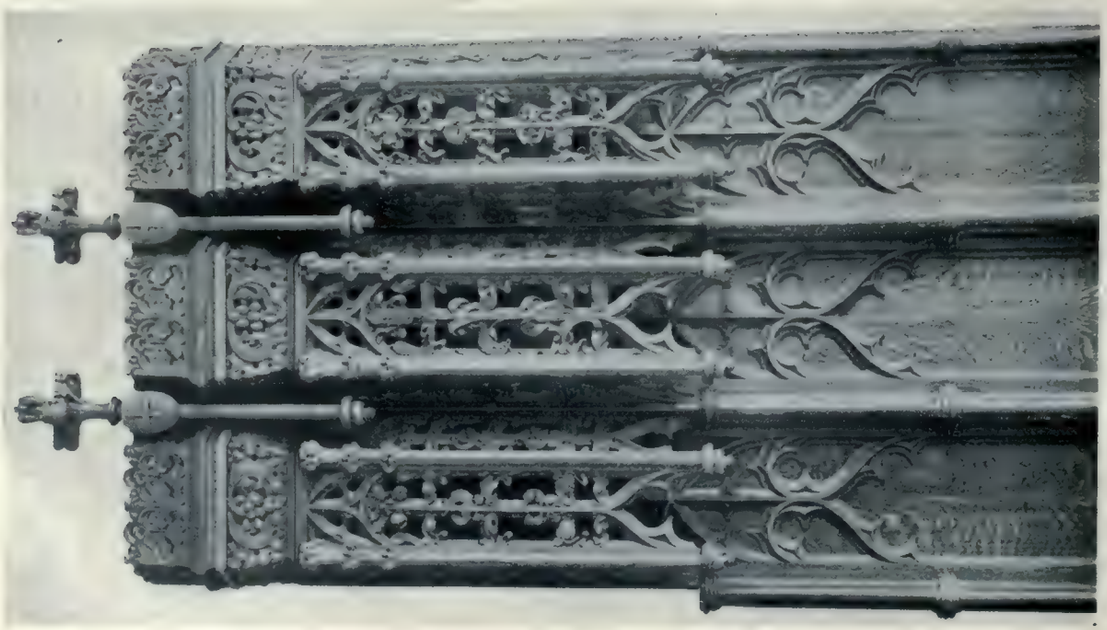
The centre canopy is 10 ft. 6 in. high, and is octagon in plan. The lower portion is composed of open work tracery panels with free natural ornament interwoven. No two of these panels are alike, yet each is in harmony with the rest. The posts are terminated with winged cherub heads. The cornice is enriched by free ornament of conventional design and further embellished by a carved and perforated cresting; a slender crocketed pinnacle rises from each post. Above the cornice is a tier of open tracery panels of strictly conventional character with a second series of crocketed pinnacles at



INTERMEDIATE CANOPIES (LEFT).



CENTRE CANOPY.



INTERMEDIATE CANOPIES (RIGHT).

DETAILS OF CARVING, ALTAR AND REREDOS, CHURCH OF ST. JOHN THE EVANGELIST, HAMILTON, ONT.

FIGURE OF ST. MICHAEL.

CENTRE PANEL OF ALTAR.

DETAILS OF CARVING, ALTAR AND REREDOS, CHURCH OF ST. JOHN THE EVANGELIST, HAMILTON, ONT.

FIGURE OF ST. GEORGE.

each angle, and these in turn surmounted by a tapered tracery spire terminated with a large carved finial.

The side towers, 13 ft. 6 in. in height, are a particularly pleasing feature of the design. They form each a niche for the figures which stand on pedestals. The posts of these towers are triangular in plan, the apex being to the front and the angles covered by a slender turned post. The foremost one proceeds in front of the cornice and terminates in a carved pinnacle, producing an unusual and pleasing effect. The sides of the triangular posts are decorated by a perforated grape vine ornament, freely carved in natural foliage. The illustration of the upper canopy of these towers show the detail of this ornamentation very clearly, the deep shadows of the recess throwing the lines of the carved tracery of the panels into prominence and producing a light and lace-like effect. The illustration also shows the rich modelling of the carved cornice and cresting very distinctly.

The intermediate canopies have a special feature in their open work carved panels, eighteen in number, which are all cut to a different plant motif, the Rose, Thistle, Shamrock, Maple Leaf, Wheat, Vine and Pomegranate being exemplified among others. The skill and individuality of the craftsman are especially noticeable in these panels, making them a dominant feature of the whole work.

The figures stand 36 inches high and are carved of solid oak. The figure of St. George closely follows the "Donatilli" St. George. The figure of St. Michael was still in the hands of the carver when the photo was taken.

The whole is generally conceded to be an exceptionally fine piece of wood craftsmanship, as well as an excellent example of "Made in Canada" art. The work in its entirety was produced in the workshops of the Valley City Seating Company, Dundas, Ontario, and was executed by their regular staff of designers and craftsmen under the supervision of Mr. W. P. Witton of the firm of Witton & Walsh, architects, Hamilton.

It is, to say the least, a superb and inspiring memorial, one which is admirably executed, and a lasting credit to those who conceived and executed the design.

Rapid Bridge Construction Under Difficulties

A difficult piece of bridge engineering in London was recently carried out by a British firm of contractors. It was necessary to build a reinforced concrete bridge with a forty-five feet span over a canal without interrupting the traffic for any appreciable length of time. This condition made it impossible to use the customary understructure of timber. The engineers therefore decided to construct the three girders of the bridge on shore. Piles were driven to support a timber track of temporary steel girders across the canal; and after the girders of reinforced concrete had been built, they were lifted on to two four-wheeled trucks and launched over the temporary track. When they were brought to the correct point they were supported by jacks, the temporary track removed, and the girders lowered into their final position. The operation was performed very speedily, although the centre girder weighed fifty tons.

VIEW FROM HEYWOOD CRESCENT.

MAIN FLOOR PLAN.

LOWER FLOOR PLAN.

THE NORWAY PRIMARY SCHOOL, TORONTO.

GEORGE, MOORHOUSE & KING, ARCHITECTS.

Norway Primary School, Toronto

THIS building presents certain features that are new to school architecture in Toronto. Before dealing with these, a few words might be said about the general problem of planning the school.

Referring to the block plan, there were two possible sites for a new school, as it was not considered satisfactory to add to the existing building.

In order to get the maximum of space for playground, it was decided to build on the southwest portion of the site. The ground was of little use to the children, as there was a drop of about eight feet down from the existing school ground to the level of Heyworth Crescent.

Another consideration was that for a primary school, the Board of Education was anxious to come as near the one storey type as possible, keeping in view at the same time, economy of expenditure and area of land occupied.

It was therefore decided to adopt an elongated plan with the rooms for the smallest children all on one floor, entered from the existing playground with as few steps as possible. The lower floor, comprising household science, manual training and swimming pool, is accessible from Heyworth Crescent through entrances directly opposite leading to the floor above.

Other considerations affecting the plan were requirements by the Board that the lavatories should have separate direct entrances from the playground, and that the swimming pool should also have a separate entrance, so that it could be used independently of the school if required.

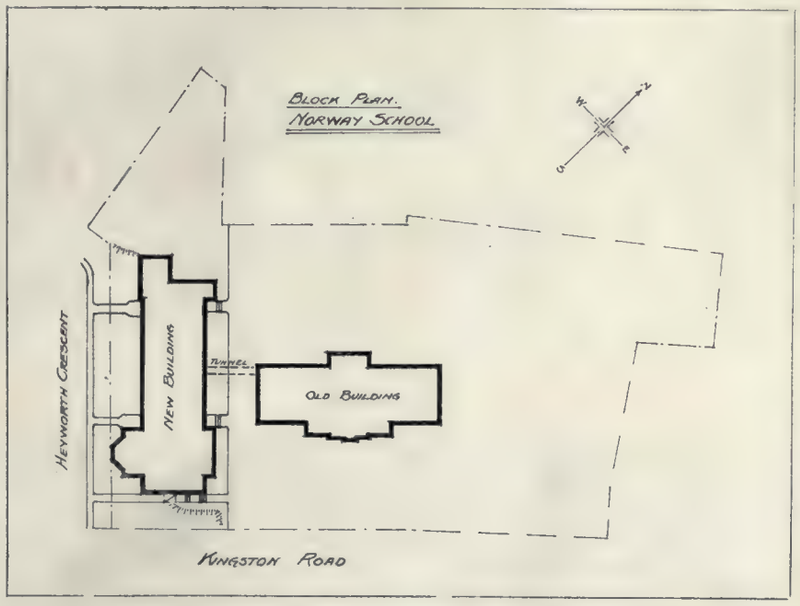
Accommodation.—The accommodation of the main floor is as follows: Four standard class rooms, kindergarten with gift room, lavatory wings at opposite ends of the building, administrative offices consisting of principal's room, waiting room, medical and dental rooms, and teachers' rest room for which the existing building had not space available.

The lower floor (on the level of Heyworth Crescent) provides a swimming pool and locker room, one standard class room, manual training and household science department, including sewing room, kitchen and demonstration dining room, bedroom and bathroom.

In addition to the above, suitable accommodation is allowed for teachers' lavatories, caretaker's room, supplies and mechanical equipment.

Construction.—The building is of combination brick and hollow tile construction, with the exterior in stucco with red brick pilasters and Bedford stone coping.

Ventilation.—The classrooms are direct ventilated by windows, the transoms of which are operated by worm gear operators which will open the windows to any degree required. Extra radiation is allowed on this account. Foul air is withdrawn by means of an exhaust fan. A separate fan works on the exhaust of the foul air from the lavatory fixtures. Transoms between the class rooms and corridors afford cross ventilation if required.



BLOCK PLAN.

Wardrobes.—The wardrobes are a feature employed in Toronto for the first time, and are divided into three compartments, with rolling shutters which close down to the floor. A small air vent opens to the outside air, and on the opposite side of the wardrobe is a direct connection with the exhaust system, so that the air from the classrooms is not drawn through the clothes, and the foul air from the clothes does not get into the classroom. This system is also economical of space, as the wardrobe for one classroom occupies thirty square feet, as against one hundred and sixty square feet of space for the ordinary type of cloak room. In addition it renders practically impossible any theft of clothing or articles from pockets. A cupboard at the end of each wardrobe is provided for the teacher. Umbrella racks and space for rubbers form a part of the fixture.

Kindergarten.—The best aspect, namely,

VIEW FROM PLAYGROUND.

KINDERGARTEN.

THE NORWAY PRIMARY SCHOOL, TORONTO.
GEORGE, MOORHOUSE & KING, ARCHITECTS.

southwest, was chosen for this room, the brightness of which is enhanced by a large bay window. A fireplace also adds to the cheer and comfort of this department, which with the household science department on the floor below, is finished in white enamel.

Heating System.—This is a low pressure two-pipe gravity return system operated from the old building, a new 60-inch by 12 feet tubular boiler being twinned with the existing boiler of the same type. The supply and return pipes are carried under the playground through a tunnel which connects the two buildings.

The heating of the main rooms is controlled by an automatic temperature control system, and the boilers are operated by oil burners of a rotary type. The heating system of the old building has been reduced from a high to a low pressure system, and a high pressure steam engine operating the fan for ventilating the old building has been replaced by an electric motor. Automatic electric pumps are installed to take care of the returns in both buildings.

Swimming Pool.—This portion of the building is not being completed at present, but is designed for a shallow tank, 25 feet by 30 feet, with a depth of 2 feet 6 inches and 3 feet 6 inches. A water heater, circulating pump and water filter with a capacity of 2,000 gallons per hour will form the mechanical equipment of this department, and locker room, showers and lavatories are provided for.

Clay Products Association Hold Meeting

The nineteenth convention of the National Clay Products Association was held at the Carls-Rite Hotel, Toronto, on January 25-26, when an interesting programme of technical and practical subjects were presented for consideration and discussion, about 150 members being in attendance.

Mr. Wm. Burgess, the retiring president, welcomed the delegates, and in the course of his remarks reviewed the effort which was made by the association during the past year to prevent the sale of prison-made bricks, declaring that in view of the low profit margin on brick-making, advances in wages and transportation charges and overhead generally, all possible business is required to keep the plants employing over 4,000 well-paid workers running during the winter months. He also denounced the proposed bill fixing a universal eight-hour day, as well as the request of labor for a 100 per cent. indemnity under the Workmen's Compensation Act. The viewpoint of the speaker was fully endorsed by the convention, and after further discussion, it was decided to send a deputation to interview Premier Drury. It was pointed out that the natural condition of the clay industries precluded the possibility of working eight-hour units, as the kilns must be kept burning, or their contents be ruined.

Mr. J. Clark Reilly, general secretary of the Association of Canadian Building and Construction Industries, delivered an optimistic address on "The Outlook in the Building and Construction Industries," in which he ventured to predict that within the next few years when conditions became more stabilized, that the volume of construction work will be on a scale that will far surpass present expectations.

Other addresses and papers presented during the convention were: "New Ideas in Pyrometry," by J. J. Mungan of Detroit; "Scientific Handling of Loose Materials," by Mr. Edgar O'Brien, Toronto; "Superiority of Clay Sewer Pipe," by A. G. Dalzell, Clay Products Agency, Toronto; "Putting Waste Heat to Work," by George Cutbush of the Don Valley Brick Works, Toronto; "Burning Fuel at Maximum Efficiency," by A. M. Wickens, Toronto; "Office and Factory Systems," by C. B. Carroll of the Office Specialty Co., Toronto; and "Tunnel Kilns," by George Booth, Islington, Ont.

An interesting talk on the subject of "Porcelain and Pottery" was also given during the meeting by Dr. C. T. Currelly, Director of the Royal Ontario Museum.

The annual banquet of the association was held on the evening of the second day, with Mr. Milliard F. Gibson acting as toastmaster. The principal speaker of the occasion was the Rev. Byron Stauffer of Toronto, who spoke on the importance of patronizing home industry as the solution of the present exchange condition. Controller Maguire, of Toronto, spoke on "More Power for the People of Ontario," and short speeches were given by Mr. J. M. Scott, Mr. D. C. Merkley, and the toastmaster.

Other social features of the convention were a largely attended dance, two theatre parties, and a visit to the Royal Ontario Museum.

The election of officers resulted as follows: President, Ryland H. New, Hamilton; first vice-president, Millard F. Gibson, Toronto; second vice-president, T. H. Graham, Inglewood; third vice-president, Andrew Dodds, Mimico; secretary-treasurer, Gordon C. Keith (re-elected).

All the past presidents of the association were made members of the executive, to which further additions were made by the election of the following: D. C. Merkley of Ottawa, Charles Wallace of Toronto, Mr. Nicholson of Toronto, and Geo. Price of Toronto. Additions to the education committee are: C. B. Lewis and Charles Wallace. The auditors, Andrew Dodds and C. B. Lewis, were re-elected.

Winnipeg Building Conference

APART from bringing the Association closer to the attainment of its objects, the recent Winnipeg conference of the Association of Canadian Building and Construction Industries consolidated to a successful degree the work which the Executive has carried on up to date in building up a representative national organization. Meetings were held on January 19-20-21, and comprised five business sessions in addition to fully attended luncheons on each of the three days, a total of 133 delegates being in attendance, of whom 55 were general contractors, 43 sub-contractors and 35 members of the supply section.

In addition to the reports of the committees on Standard Form of Contract and Standard Practice, other subjects before the conference were: (1) The possibility of a standard wage for the west, with the advisability of holding a western labor conference; (2) the advantages of a uniform plan of arranging wage discussions and of promoting a uniform schedule of wages in certain zones having similar conditions; (3) need for action on the part of the Federal Government in proceeding with work included in the estimates but held up; (4) a better Workmen's Compensation Act in Saskatchewan; (5) a uniform Mechanics' Lien Act throughout Canada; (6) present lack of efficiency and low production; (7) advisability of an eastern and western Executive Committee for the Association; (8) the extension of the same idea to the eastern and western Standing Committees.

A recommendation was also received from the Montreal Association suggesting that the voting powers of the delegates from local Associations and of individual members be more clearly defined. Also that every local exchange be notified in advance of all business likely to come up at a general conference, and that the question of wage agreements and the discussion of labor relations be left to the individual exchange.

STANDARD FORM OF CONTRACT.

The Committee on Standard Practices reported that 19 forms of standard contracts had been under consideration, and that joint meetings had been held with representatives of the Engineering Institute and the Royal Architectural Institute of Canada. A specialist in this kind of work, Strachan Johnston, had been consulted, and had assisted in the preparation of the four forms which were presented, and recommended to the conference: (1) Standard General Conditions; (2) Standard Cost plus Contract; (3) Standard Straight Contract; (4) Standard Sub-Contract. The committee was given power to consult further with the architectural and engineering bodies, and advise as to their conclusion.

REPORT OF STANDING COMMITTEE ON LABOR.

The conference endorsed the action of the Standing Committee on Labor in entering into arrangements with labor for the formation of a National Joint Conference Board, and approved of the Constitution of the Board as formed. It further approved of the formation of local joint industrial or conference boards, and of the Apprenticeship Plan adopted by the National body, the representatives of the association on the board being instructed to make every effort to get the system into operation as rapidly as possible.

This report also included a resolution for the appointment of a committee to undertake propaganda work, with a view to presenting to the public generally and labor men in particular, the necessity of increased efficiency in the matter of production, and the advantages accruing therefrom to the whole community.

Another matter under discussion was a proposal to change the name of the Association, but this failed to carry, it being decided to retain the name as it stands. It was recommended in this connection that when a new name was adopted by local bodies a name similar to the parent body should be used, substituting the name of the town for "Canadian." Also when the name of a local body differs from that of a parent body, the words "Affiliated with the Association of Canadian Building and Construction Industries" should be used.

REIMBURSEMENT OF CONTRACTORS.

Regarding work done on Federal undertakings subsequent to the war period, it was felt that the Government should reinburse contractors up to their total net cost for any losses sustained; a resolution to this effect being adopted as follows:

"Whereas contracts were let by the Federal Government during the war on the cost-plus basis; and whereas, since the armistice, assuming conditions had again become stable, contracts were let on the fixed lump-sum basis; and whereas conditions have prevailed since the armistice, due to increased freight rates, material costs and labor costs, which were entirely beyond the control of any contractor; be it resolved that the Federal Government be urged to reimburse such contractors up to the amount of their total net cost, providing such cost has not been due to negligence or other serious fault on the part of the contractor, and also provided that such net cost be duly established and certified by a chartered accountant."

It was also decided to have the president arrange for a deputation of influential members to interview the Government with reference to proceeding with delayed public work, the consensus of opinion being that costs will be as low during the next two building seasons as will be experienced for some time to come, and that a further reduction cannot be expected until there is a marked increase in production.

Prominent speakers addressed both the business meetings and the daily luncheons. A civic welcome was extended to the delegates by Mayor Parnell of Winnipeg on the opening day when the delegates also had an opportunity of listening to an inspiring address by Kennedy, president of the Building Employment Association of Detroit, on the "Optional Plan of Employment."

Other speakers were the Hon. T. C. Norris, Premier of Manitoba, and S. C. Oxton, Deputy Minister of Public Works for the Province, who spoke on the "Building Material Resources of Manitoba"; R. W. Craig, K.C., President of the Canadian Club of Winnipeg, who delivered an address on "Canadian Opportunities," and Mr. W. H. Carter, President of the Winnipeg Board of Trade, and a well-known contractor, who spoke on present building costs.

HOUSING LOAN SCHEME.

The conference went on record in favor of a Federal Government loan for housing, an amendment resolution on the subject reading as follows:

That this Association make direct representations to the Federal Government, asking them to make money available for housing loans:

(a) That the Federal Government form a National Housing Board, which shall act as the agent of the Government in investigating and recommending appropriations of money, and making it available through well-established loan companies in the various centres, for loaning to individuals for building houses, making use of the existing machinery of these companies for receiving applications and reporting on the loan, loaning money on mortgages and collecting payments;

(b) That provision be made for an owner to make use of his own labor in constructing his house, and that the owners be encouraged to build on their own individual lots; and

(c) That the maximum value of the house on which a loan may be granted be $8,000 (eight thousand dollars), and that loans be made available on duplex and three-flat houses.

1921 OFFICERS.

The executive officers for the ensuing year are: President, J. P. Anglin, Montreal; 1st Vice-President, J. B. Carswell, Toronto; 2nd Vice-President, Jas. Mackie, Winnipeg; Honorary Secretary, George H. Whitlock, Moose Jaw; Honorary Treasurer, Joseph M. Pigott, Hamilton.

Hamilton, Ont., was selected as the place for the next conference.

Outlook for Construction Work

THERE has probably never been, in the history of the building construction industry, a tory of the building construction industry, a year when it was more difficult to carry out work than the year just concluded. Regarding general overhead, job overhead and unit labor costs, we have probably experienced the peak for this generation. That, at least, is the hope of everyone present; and I am led to believe that it is a fact, and that we should from now on begin to increase efficiency all along the line —in office overhead, job overhead and individual unit work.

The same can also be said, in all probability, with reference to material costs. The same influences have, no doubt, led to the large increases in the cost of building materials. There is one thing that has always presented itself to me in considering the matter of material costs, and has helped me in making some allowance for the great increase, and that is that many of the industries producing materials had a period of very hard times in their business during the war. Many of them were going behind very seriously. It was, therefore, only natural and human that when business began to pick up they should attempt to get all they possibly could.

But I believe we have come to the time now when most of the responsible concerns are getting even with the game, and the tendency already is for a reduction of prices. Many firms have announced some slight reduction, and we believe more will follow. I am optimistic enough to believe that the worst is over, and that the coal shortage, the car shortage, the freight embargoes, the material scarcity and undue bidding for labor are things of the past.

We are in the midst of a general business slump or depression which may continue for many months. Naturally, construction in some

lines will be reduced, but, nevertheless, the long secession in the building industry, which has extended over a period of six or seven years, is about to end, and we in Canada are very soon to enter upon a building period of long duration.

There is a crying need for houses—more houses and better houses for the workers—and when I say workers, I mean all workers, and not only those who labor with their hands. We have a shortage in most cities of apartments as well as homes. We have a shortage in the large centres in the East—and I presume in the West also—of office space.

Then, there is a great expansion which must take place still in the industrial line on what we might call the normal peace basis. There must be an additional number of pulp and power plants. We also need in most cities loft buildings for light manufacturing. More and more the tendency is for industries to come to Canada, both from the United States and Great Britain. The construction of many big bridges has been held up for a long time; many big bank buildings, especially in eastern centres, have not been proceeded with; the building of many schools has been forced to one side, and also many municipal buildings and some hospitals.

PUBLIC WORKS DELAYED.

Further, there is a great deal of municipal construction work, road work, sewer work and other extensions held over. Provincial works have been minimized, and the federal public works department has practically curtailed all its work for a long time, and we believe that the time has come when it should announce a substantial program. When we say this, it is not because of any really selfish interest, but only because we feel that such a program would be in the best interests of the country. Many docks, harbors, bridges and canals need to be built or repaired.

What can prevent the greatest building period Canada has even known? First, the chief cause would be our inability to reduce costs, and by "our" I mean everybody. It is all right for me to point to you and for you to point to another fellow, but if we are going really to reduce costs to where they ought to be, it has got to be done right through the industry. We can do it by increasing efficiency, by working longer hours and by working harder when we work. You know in your executive work how much time is spent in discussing this unrest and all the other allied questions. You can hardly ever enter an office without talking about these things, and yet the best way to reduce the unrest is to work individually to the limit.

If we go to our superintendents and foremen of works with that idea and example, we will do a great deal to keep the same idea in the minds of our employees. We can help to reduce costs, undoubtedly, in this way. The continued low individual production results in restricted supplies of materials and also in the high prices of materials. It has been referred to incidentally here and at other places that when production is low, generally speaking, costs are really four times greater than when production is high. That is due chiefly to the reduction in efficiency. Then, there is a pessimism in general business and a lethargic attitude toward unrest. By "lethargic" I mean an attitude which, while it might lead to discussion of the question, leads to very little real action.

FUTURE DEPENDS UPON CONSTRUCTION.

The building and construction industry is face to face with the greatest problem it has ever been called upon to solve. Whether it is realized or not, it is a fact that the very welfare of our immediate future depends more upon a revival of building activity than upon any other single factor. Think of the mines, the forests, the mills and other industries, the railways and the shipbuilding that are kept going when we are all working at capacity in the construction industry. Our association was not "just started" you might say, it was almost born of necessity.

This is our third general conference. The first conference might be summed up in the short statement that while we realized the great need for such an organization, it was really a realization conference. The second conference could be summed up as an organization conference—organization for active work. Now we have come to the third conference. What will be said of this conference? I hope that there will be a great deal of definite action taken which will benefit the industry and the country as a whole.

I would like to refer to the much talked of subject of the troubles they are having in the organizations in New York, and troubles which they may have in other centres in the United States. I only wish to refer to them incidentally, because, fortunately, we have not conditions in Canada which would permit of such things being done to any great extent, as they have been done in New York, but to point out the great harm that can come from the wrong use of a strong organization. I hope that this body will continue to grow in strength, and that the men in control of it will endeavor to put the word "fair" into the old motto, "Competition is the life of trade." I wish I could make every employer, every worker, every architect and every engineer from Halifax to Victoria realize the tremendous importance and the absolute necessity for his best possible effort and his greatest individual support.

The Drummond Apartments, Montreal

In view of the comparatively few buildings of this type erected in Canada since the pre-war period, the new Drummond Apartments, Montreal, is particularly noteworthy as an important recent development catering to those desirous of obtaining apartment accommodations in one of the best residential sections in the city.

The building has a frontage of 70 feet and extends through from Sherbrooke to Stanley Street, a distance of 253 feet. It practically consists of two units joined together by a central court or rotunda, and contains in all forty apartments.

The superstructure is of the steel frame type with brick curtain walls lined with terra cotta and rests on a foundation consisting of 144 concrete piers, 5 in. x 5 in., reinforced 4 in. at the top. The front is of mottled rug brick with granite base and Indiana limestone trim, the upper floor being finished with buff terra cotta.

Entrance is from either street into a corridor which extends through the entire building. This corridor is finished with marble floors, caen stone walls and composite columns. A feature are the large reception halls with fireplaces in each of the two units, and the connecting rotunda having a fountain at the centre. The rotunda has a domed ceiling and is treated with ornamental pilasters with plaster beams extending from the cornice to the circular overhead light, the scheme being further enhanced by the introduction of decorative shields above the leaded glass windows and the door openings.

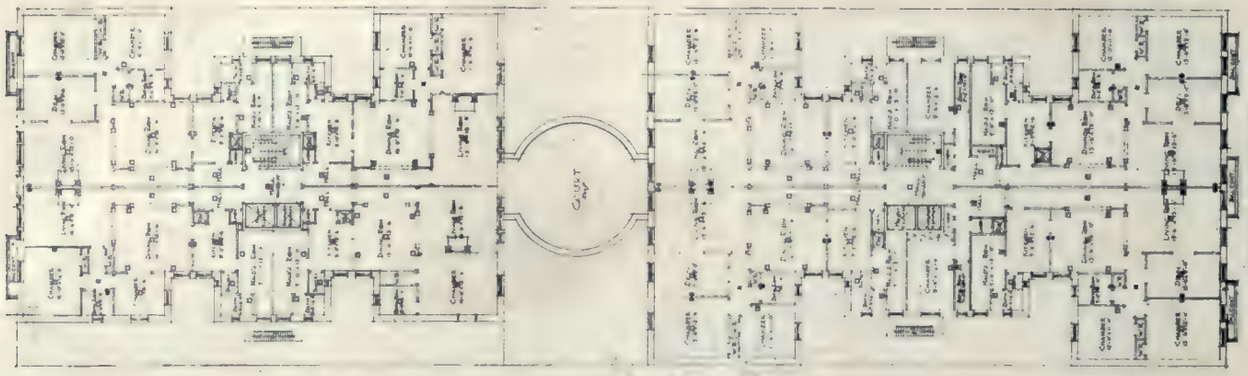
In planning the apartments space has been carefully economized, and special attention given to the question of soundproofing, the partitions consisting of two 3-inch hollow tile sections with hair-felt between, and the floor so constructed as to give the best soundproof results. There are eight apartments to each floor, four in each section of the building. These are laid out with the principal rooms ensuite, and are conveniently accessible from central elevator halls, the size of the apartments ranging from five to eight rooms.

LIVING ROOM, GROUND FLOOR SUITE.

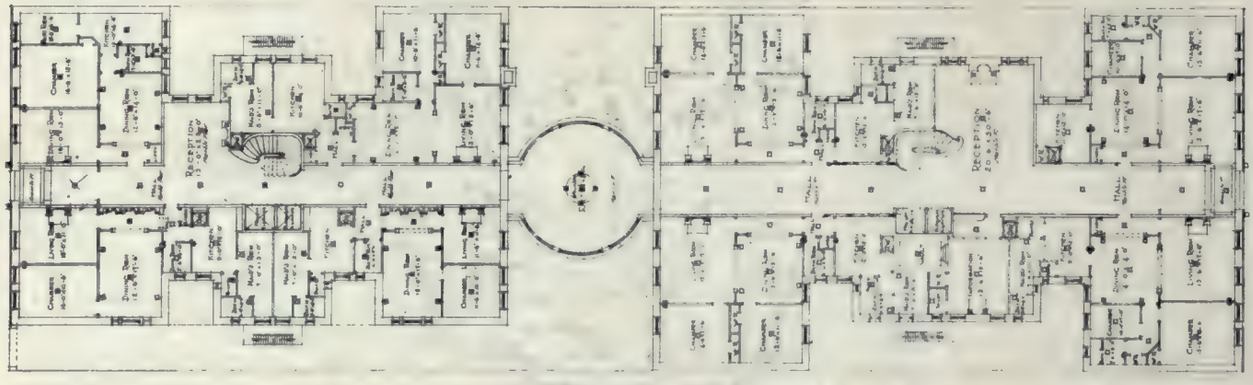
VIEW THROUGH CORRIDOR.

DRUMMOND APARTMENTS, MONTREAL

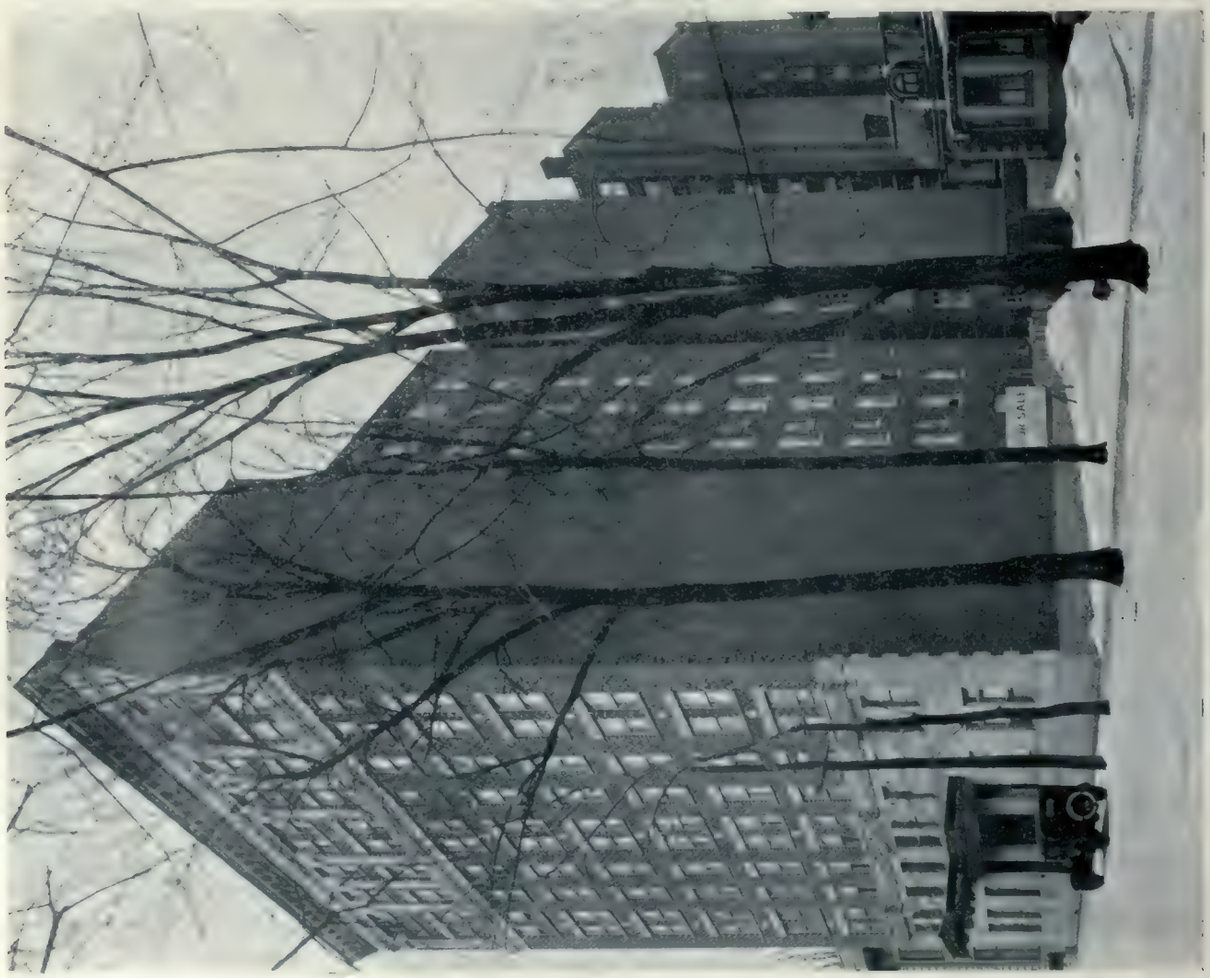
AUDET AND CHARBONNEAU, ARCHITECTS.



SECOND FLOOR PLAN.



GROUND FLOOR PLAN.



DRUMMOND APARTMENTS, MONTREAL.

AUDET & CHARBONNEAU, ARCHITECTS.

GROUND FLOOR—RECEPTION HALL.

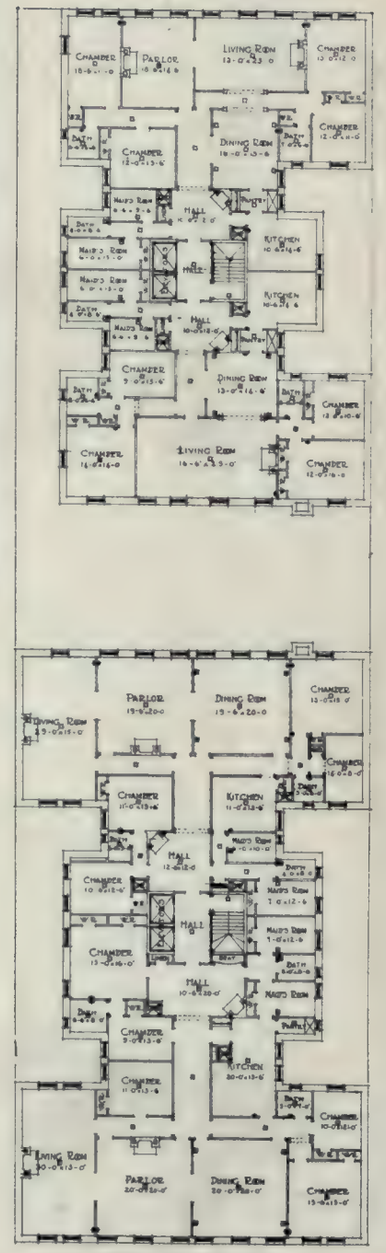
ROTUNDA.

DRUMMOND APARTMENTS, MONTREAL.

AUDET & CHARBONNEAU, ARCHITECTS.

GROUND FLOOR SUITE.

DRUMMOND APARTMENTS, MONTREAL.



TYPICAL FLOOR PLAN.

Besides the passenger elevators, there are two service elevators and eight electric dumb waiters for the convenience of the tenants. Additional service equipment includes a modern vacuum cleaning system and a refrigerating plant, the operating machinery being placed under the rotunda with the machine bases imbedded in cork and clay so as to eliminate all vibration from the building.

All apartments are finished in selected birch with oak floors and brick and marble fireplaces. The bathrooms have porcelain fixtures and tile floors and dado. The heating is done by a vapor gravity steam system with independent heating plants for each section of the building.

The building was erected and ready for occupancy in eleven months, work being carried on night and day. The basement walls are of the beam type with a heavy basement floor bonded to the top of piers. After excavating to a depth of seven feet, a strong platform was built over the entire area, from which the excavating for the piers was carried out. In this manner a row of 14 to 15 holes could be done at a time, two men in four days going down to bedrock on an average. Part of the piers are carried under the adjoining foundations.

Making Iron Pipes in Electricity

Many engineering uses are now being found for what is known as "electrolytically deposited iron." The process of deposition is similar to the familiar one of electro-plating, iron being deposited instead of silver. Worn parts of machinery can be repaired by depositing iron upon them and afterwards hardening the deposited metal by heat treatment. In connection with this process, it is interesting to note that the first practical machine for making iron tubes by means of this process was erected during the year 1898 in London, England. The trials then made were very successful; an the increasing relative cheapness of electric power in Great Britain has led to the erection of large works in England for the production of electrolytic iron pipes.

Evolution of Architecture

G. H. MacDonald, B.Arch.

Paper prepared for the Society of McGill Graduates, and read before the Alberta Architects' Association.

THERE is a general feeling among thinking people that architecture should express the spirit of our times in a new form. The question is often asked—why do we not have a new architecture?—with the implication that modern architects are not capable of this task. There is consequently an immediate snatching up of any new forms or expressions fondly imagined by their originators, new styles, succeeded by as sudden relinquishment of these new forms comparable only to the rise of a rocket and the descent to earth of a blackened stick.

The grace and beauty of the old forms still continue though not expressing adequately our national life.

In a number of newspapers there recently was published a picture of a domical structure covered with Moorish detail, with concave sides, with the statement: "The only new thing in architecture in five hundred years"?—implying that to be a new thing was of all things most desirable.

We have always wondered at the ephemeral life of these so-called new styles, and it would appear worth while to further study their manifestations, the persistence of the old, and the prospects for the future, with the underlying reasons for all.

The evolution of the art of architecture, architectural design, is of supreme interest to architects. To forecast the tendency of the art and to assist in shaping its course are the measure of the architect's success. Whatever may be said with regard to future tendencies and possibilities of a new style, a full knowledge of the historical background is essential, for it is ignorance that produces error, and the man who is untrained in the thought of design is bound to produce chaos.

ORGANIC AND APPLIED ARCHITECTURE.

The great national architecture of the past can be divided into two general schools, functional or organic, and applied architecture. The first illustrated supremely by Egyptian, Greek and Gothic, the latter by Roman and Renaissance. Each period borrowed something from the past, but each was distinctly the product of the period in which it evolved.

In chronological order, the Egyptian architect employed a massive construction of column and lintel ornament derived from the natural forms that surrounded him; the naturalistic derivations applied to the functional parts of his structure; the higher forms, such as the human figure, reserved for friezes and wall spaces. Religion and the state were one—a religious mysticism. The expression in architecture was gloomy, massive and dark.

The post and lintel construction formed the basis of Greek architecture also, refined and modified; with the advance of science and aesthetic taste, columns became slender and beautiful, intercolumniation wider spaced, giving greater light, and entablatures graceful, appearing light by their very proportions. A new basis of ornamentation founded on new natural flora and the symbols of a new civilization; the acanthus of the arid country superseded the lotus and reed of the marshy Nile. The sequence of the Egyptian ornamentation was carried out and elaborated to the highest power. Mouldings, the lowest type of ornament, were decorated with mathematically derived and the lower forms of plant life conventionalized. Capitals were decorated with the higher forms. The frieze, lower forms of animal life and state and religious symbols. The tympanum, the highest forms of animal life, the human figure, and this sequence has been followed in all the great styles of architecture. Refinements unheard of and never equalled were introduced, such as corrections for optical illusions. A true expression of a national life at once ordered, refined, devoted to beauty and science, comparatively free, in which individual opinion was freely vouchsafed.

With the translation from Hellenic to Roman civilization we have the first great departure in structure—the arch and vault. The traditions, and in fact portions, of the earlier architecture were maintained by decorating the surface of the structure with columns and lintels. Ornament partook of much the same nature as that of Grecian civilization, which was not far removed, but much coarsened and lacking many refinements, extremely rich and florid. A sumptuous, sometimes vulgar, generally over-decorated and restless architecture, expressing a civilization seeming powerful and rich, but hollow, unsettled, professing freedom but despotically governed, lacking in morals and restraint, in which the spoils of conquered nations were displayed to the glorification of their conquerors.

Byzantium produced an architecture almost organic in its nature. The system of domes and semi-domes almost as organic as the best ex-

pression of the Gothic. Built, however, of base materials but faced in all the glories of older fragments and the symbols of the new Christianity carried out in marble and glass tesserae.

The Romanesque of the dark ages was the expression of a feudal civilization, in which the church was supreme. The only source of learning and light. Massive and gloomy, ornamented by the axe of the peasant and serf, directed by the learning of the churchman. Partaking of the Roman influence at its inception it quickly assumed the characteristics of a new savage and crude civilization. A new functional ornament evolved from the foliage of the indigenous oak and vine and the symbols of church, a vigorous and true representation of the times, a development of the Roman vault and arch, dignified as nature herself.

The Gothic, which succeeded and grew out of the Romanesque as the feudal civilization advanced and the church continued to grow in power, introduced the pointed arch, a system of balanced thrusts, flying buttresses, clustered piers and thin vaulted roof, which in the last analysis seemed almost to float in space. The science of construction now reached a high pitch, arches were laid out with the inverted chain and the strength of the materials tested to the utmost by practical experiment. The symbols of the church expanded and formed the basis for the significant ornament, natural flora conventionalized was carried to great refinement as functional ornament.

Stained glass reached its culmination telling the sacred story; the windows released from the thraldom of heavy walls soared aloft in supreme splendor. The art of heraldry reached its zenith and formed the basis of a significant ornament, for which we have since had no substitute. The shields of the nobles dimidiated and quartered, blazoned in all the colors of gules, azure, sable and or, provided the finest significant ornament the world has ever known. The language of heraldry universally understood, in some measure even by the lowest, surpassed even the insignia of the church.

A highly organic architecture in which each rib had its corresponding column and each mullioned window the story of a saint, the Gothic was the development of a highly organized state, in which the king, the noble, the knight, the squire, the herald, the page, the fool and the serf each had his appointed place.

The supreme power of the crown overtopping the powers of baron and ecclesiastical authority, broke down the fuedal system and to some extent emancipated the lower classes. Learning became more widely disseminated, and the palaces of royalty, the homes of the people and their leaders, colleges founded by the crown comprised the bulk of the new building during the Tudor, Elizabethan and Jacobin periods in England, chateaus of France, and the early palattzos of the great Italian states.

RENAISSANCE PERIOD.

The revival of learning in Italy spreading to other European countries with the study of the remains of previous civilization, was expressed in Renaissance architecture. At first grafted on familiar construction and taking at its seat the closest attributes of Rome, it finally merged into the full flower of Renaissance architecture, savored by the national characteristics of each country it invaded. No organic architecture this, but a fine veneer decorating the sturdy national fabric, and though springing from a common fountain-head, distinctly national. The expression of a civilization in which a knowledge of foreign culture was considered essential to education, and in which a quickening interest in the outlying world was the outstanding characteristic. An age of reason superimposing a facile knowledge on a changeable social scale.

Granted that art has no morals (a refined pagan would produce a greater work of art than a civilized Christian without art feelings), it is evident that the study of past styles demonstrates clearly that national life is the deciding factor in architectural expression, and that the civilization produces the style of architecture. Now what comprises style in architecture? Most certainly the system of construction, the proportioning, arrangement and grouping of the parts and its decoration, both functional and significant. It has been clearly demonstrated that civilization generally as it advances manifests itself in a new situation, the Renaissance notwithstanding, when it does repeat or appear in some new form, as in the Italian Renaissance, its expression in architecture, though changed, is ruled by its former state. The greatest revolution in style then occurs where the greatest change in civilization occurs. It would be reasonable then in looking for decided symptoms of any new style of architecture, or a decided breaking away from old styles, to lay great emphasis and expectations on the development of American life and architecture.

GEORGIAN AND COLONIAL DESIGNS.

Has America in the past developed a new style of architecture? No thinking person will deny that English, French and Italian Renaissance are distinctly national in character, no matter how closely they may approximate their common origin. Similarly Colonial architecture in America is distinctly an American Renaissance national in its manifestations. "True, in the last analysis it was not local carpenters and builders that designed these homes in a new land, but the master minds of English Renaissance of the corresponding Georgian period

working through these master workmen, dealing with new materials in a thoroughly suitable manner. And it is equally true that the excellence of their design is most emphatic where they followed most closely the traditions of the school in which they were trained and by which they were influenced."

Colonial architecture reached its grand epoch immediately preceding and succeeding the American revolution. The old aristocracy passed away about 1825, but unfortunately did not bequeath to their children the whole legacy of restraint and refinement they represented. The new spirit was typified by Andrew Jackson, "who denounced the refinements of life as attributes of an overbearing aristocracy, full of danger to the liberty and strength of the new nation."

The three R's were the acme of general education. The social fabric became highly disorganized. The period which followed has been called the transitional period. John Ruskin arose as the Prophet of a Gothic revival, and ushered in the battle of styles. He has been described as an "old fogey" and may in general be said to have confused ornament with architecture. His greatest influence perhaps was the revival of a new interest in the ancient crafts. A Ruskin Gothic cottage was considered to be a necessity of the times, and in the words of one writer, "The Gothic chancels and rood screens were robbed to supply the typical makeshift American verandah." Equally familiar and outstandingly representative of the transitional period was the poverty-stricken application of classical detail, homes were even designed as Greek temples. However, the best work in this style was well executed, its chief fault lying in its inherent proportions.

The balance of the period of transition immediately following the war of secession, 1864, was occupied by a form of Jacobean architecture, not the Jacobean, however, of England, but the Italian villa with a cupola carried out in the products of the lathe and scroll saw. Although the war had strained the credit of the people, at its conclusion, in the North, the profiteers and others, even the majority of the people had become comparatively wealthy, and the tendency in building was to make as much of a display as possible, no matter how ridiculous.

The period immediately succeeding might well be called the period of fashions. The Exposition of 1876 furnished a pageant of the arts and revived a wish for more artistic expression. This took the form of a willingness to try almost any new style, and the fashions that succeeded comprised the East Lake School, resembling somewhat the Swiss Chalet, Queen Anne, embellished with Romanesque ornament, a revival of Romanesque and the Victorian Gothic.

H. H. Richardson designed Trinity Church, which was an acceptable design in Romanesque, and was immediately followed by a host of imitators, most of whom did not even get the spirit of his work. In fact, Richardson said the first and last word for Romanesque in Trinity Church itself. The feudal spirit is too far removed from modern requirements to be a facile element for the solution of our problems. It has no domestic feeling in the way that Tudor is the domestic expression of Gothic architecture. In fact, these various fashions of the period, lack both the elements of restraint and historical significance necessary to a domestic architecture. As one writer has put it, when establishing a home the owner wishes to feel that he had two parents, four prandparents—in short, a family tree from whom he has inherited certain heirlooms; that these worthy antecedents lived to a certain degree is due to the owner's desire to preserve a worthy link with the past. This is the reason why Colonial houses have pre-eminently the satisfying feeling of historic tradition and domestic atmosphere.

Richard M. Hunt looms large on the background of this period. A student in foreign universities for twelve years, he concerned himself with the prevailing mode, Victorian Gothic, for about twenty-five years, when suddenly, without warning, this remarkable man ushered in a new era in American architecture, which has continued until the present time. It has been fittingly called the era of "*adaptation.*" The occasion of this startling change was the erection of the Vanderbilt house at 5th Avenue and 52nd Street, New York, decidedly in the manner of the French chateau.

The evolution of architecture through past ages we found was the expression of the guiding spirit of the epoch in which it occurred. This is further confirmed by our summary of American architecture just outlined. We can further elaborate this into the conviction that architecture unrestrained by settled conviction catering to the fashion of the moment and the expression of a similar state of society, produces no cohesive or progressive style.

MODERN STYLES AND TENDENCIES.

The last decade or so has produced many beautiful buildings by the process of adapting the work of previous styles, and so many occasions previous buildings, to American requirements, all too recent to need enumeration here. The domestic feeling of the English Elizabethan and Tudor and the dignity and historical tradition of the Colonial have each appealed to the home builder, and public buildings have run the gamut from Gothic to Renaissance and the well studied classic, and the votaries of the process

maintain that expressing the commercial spirit of our age through this process will eventually evolve a distinctive architectural style for the future. This is "applied architecture," however, and not organic. Opposed to this school are the dissatisfied element who have, generally speaking, not been as capable as the leaders in the school of adaptation. A few attempts have been made to start a distinctly new style. The art nouveau had a brief popularity, distinctly unsound, violating many canons of art, lacking in significance, and was short-lived.

The California bungalow, lacking in unity, generally atrocious in detail, still maintains some measure of popularity, saved only by its convenience and the unifying effects of mission stucco, brick and shingles, and wide spreading roof.

A certain type of warehouse in which bands and vast triangles of brickwork have attempted to replace functional and significant ornament of the historical past. These and other attempts simply emphasize the argument of the extreme conservatives that "invented architecture has no more atmosphere than exists on the face of the moon." These attempts, however, are most open to criticism, though the fact that they violate the principles of design and unity.

The individual cannot create a style, only fashion. Style must be a national growth. If these sporadic growths had contained any inherent virtue they might have formed a basis of future style, but as a simple exaggeration of the weakest features of other styles, they have been purely ephemeral.

Developing a new style of architecture with the most complete detachment from ancient forms, would involve the evolution from the national consciousness of a new system of construction, new proportions and new functional and significant ornament. We have evolved two new systems of construction, cage steel construction and reinforced concrete. As far as the first is concerned, it must remain applied architecture, the skeleton faced with other materials, except in a case of such structures as railway train sheds. Reinforced concrete affords an organic system of construction, which, if the material were intrinsically beautiful, would furnish an organic architecture. This would be possible, let us assume, if the aggregate were composed of marble chips, crystal sand and atlas white cement.

A new type of building has been evolved in the skyscraper, a type of building quite symbolical of the spirit of the age. The school of adaptation attacked this problem with their familiar tools. That is, with storey superposed on storey, emphasizing the horizontal. It remained for one of their opponents of the rival school, which we may call "moderns," to set them right. Louis H. Sullivan, in the Prudential Building at Buffalo, New York, was the first to emphasize in this type of building its true spirit. This is described as a "force of altitude, rising from bottom to top without dissenting line, a proud and soaring thing." He emphasized the idea of protective casing, through which the metallic construction is more palpably felt through the envelope of baked clay, expressing on its exterior its purpose, the American spirit. Rows on rows of windows suggest "monotonous, obscure and laborous lives, the upspringing shafts of the vertical piers stand for their hopes and aspirations, and the ornament which covers the whole with a garment of beauty, the texture of their dreams." This example has been followed largely in succeeding work of this kind. The skyscraper itself is a distinct embodiment of the spirit of our times, in that it represents vast combinations of wealth, disregard for the rights of others in shutting off their light, and darkening and limiting their lives, and at some distant date in future, with the changing ideals of democracy, or if not through sheer necessity, will be modified or largely eliminated. We have therefore two of the essentials of a new architecture, new system of construction and new type of building.

WHAT WILL FUTURE OF ARCHITECTURE BE?

As mentioned, a new national consciousness might eliminate the skyscraper. In fact, new trend of national thought will undoubtedly greatly influence future production in architecture. Therefore, it is difficult to form an idea of what the architecture of the future will be; whether it will be a new development expressing new tendencies of national thought, or whether changes in national consciousness will in future continue to be expressed by an evolutionary adaptation. You may ask in what way could changes in national thought influence architectural design. Much public opinion expected that the end of the war would realize a new brotherhood of man based on the famous "fourteen points." Assuming for a moment this very Utopian state had eventuated, how would this have influenced the housing of, say, the office workers? In many large corporations, such as banks and railways, the workers are housed in one large room, for two reasons—the first being for display, the second being that all working to one end there is no necessity for secrecy. Only when the workers are in competition with opposing interest are the barriers kept up. The fact that all were working in the common interests of their fellows would permit of a whole office building being open. The cellular construction with closely locked doors could be done away with, each working in the interests of all, opposing business could be carried on at neighboring desks, for each would have the interest of the other at heart. Simi-

larly, unnecessary noise would be eliminated through consideration for others. This would make a very great change in architectural arrangement for example, and would give a new expression to our architecture.

Structural necessity is defined as the foundation of art, even in earliest times the arch was used by nations who were forced to build with small units of material. In future construction we will be limited only by the possibilities of steel and concrete, up to the point where national spirit steps in and for the good of all forbids further extremes. With the development of a glass excluding heat and cold, future architecture may well take on the semblance of an architecture of light. Given a new construction, a new idea, we require for the completion of our cycle new sources of decoration. At first glance it might appear that the last word had been said in the production of ornament. Lacking heraldry, and no great religious or other movement furnishing new significant ornament and symbols, the ever present finality of the perfected ornament of the past has always overpowered attempts along these lines. In the case of mouldings, both segments of circles and elliptic sections have formed the basis of past styles. Some of the moderns, such as Sullivan, have in a large part attempted to omit mouldings in their designs, using flat bands and perpendicular panelled and ornamented projection surfaces. It is true that a moulding in the last analysis only furnishes lines of shadow, and is seen in silhouette at the angles only. The same effects can be secured by the use of a series of square projections, grooves and sloping surfaces, lacking, however, the pleasing graduations of shadow characteristic of mouldings. We can derive a fair field of significant ornament by conventionalizing the tools and symbols of commerce. A relief carving of an automobile is a fitting symbol for a salesroom devoted to that phase of commercial life.

Decoration of surfaces and of the lower functional forms can be dealt with through the new field of decoration opened up by such men as Claude Bragdon by the study of the derivation of ornament through fourth dimensional projection of geometrical solids, and pattern ornament from the functions of number. These are well established systems, the result of a vast amount of effort furnishing gratifying results and capable of great extension. Much has also been done by the adaptation of old forms to new plastic materials, such as terra cotta and the conventionalization of new organic forms.

An art of light, mobile color, is also contemplated and great advance has been made in the art of lighting itself, as is exemplified in some of the newer theatres. The study of mobile color has been carried on, based on the analogy of light to musical harmonies. Greek and Gothic architecture was strongly decorated with color. We now live in a comparatively sombre age, exaggerated even by the ever present horror of red brick. The architecture of the future points to great decorative expansion through the use of color applied in the ancient manner and through the use of colored materials. The architecture of the future might well take on then the phases of a new awakened national consciousness, the use of new constructive systems, newly derived ornament, an art of a "light, space and glorious color."

It has been observed that art is commonly evolved in three stages, first, the ardent and inspired embodiment of a great idea, giving strength and splendor. Second, original inspiration tempered by increasing knowledge and clearer appreciation of limits, the result being symmetry. Third, ebbing inspiration, details elaborated and novelties introduced to make up for loss. This occasions a brilliant but somewhat disproportionate style. Are we at the first or last stages? If we accept the argument of the school of adaptation, it is possibly the latter, but we are not without hope even here, for we must remember that with a few numbers endless combinations can be made. Mozart, the great musician, made no new form, destroyed no old ones, but acted on the principle that mastery of form leads talent to ever increasing freedom. He saw no necessity for the creation of new forms, because he did not feel the shackles of the old ones. To him they were chains of roses, for fashion is no restraint on genius. Mozart accepted the material of Italian opera as he found it, but he filled the old forms with a new spirit.

It is generally conceded that if you have nothing to express it is better to keep silent. We may be on the fringe of the first stage of art evolution, lacking at present the main essential, a great national idea. The great architecture of the past was the expression of the rule of a class who, having great resources at their command over a long period of time, used these resources consistently and persistently for the advancement of a great idea, *i.e.*, church or state. Where these resources were subverted to private ends, as in Roman civilization, the national expression in architecture did not reach its highest and most inspired development.

Judging from the development of previous great styles of architecture, democracy, with no intrinsic concrete and sustained development of an idea, is probably not capable of expressing itself in a unified art development, leading to a great style. Better then to continue to express the historical traditions of the past than momentary phases never reaching the point of

Concluded on page 64.

On the Economics of Building Design

An analysis of the cost of the elements entering into the construction of reinforced concrete building.

By J. Morrow Oxley, A.M.E.I.C.

Paper presented at the General Professional Meeting, Engineering Institute of Canada, Toronto, February 2nd, 1921.

THE purpose of this study is to express graphically and by tables the relative effect on cost of variations in the proportions, dimensions and floor loading for the standard type of building considered.

The method employed is to study first the main elements individually, then to combine them into a complete building, and finally to make applications to specific problems. Only the structural elements are considered in the present study, but it is hoped that at an early date a similar analysis of the mechanical elements will be made. The latter are not of as great importance for comparative purposes as the former, as the items of heating, plumbing, lighting and sprinkler equipment vary almost directly with the cubical contents or floor area of the building, and elevators are the only mechanical item of which the relative cost varies greatly for changes in the height of the building.

TYPE OF BUILDING.

The type considered is a two-way flat slab reinforced concrete building, with brick spandrel walls, solid metal sash glazed with clear glass, concrete coping and sills, cast in place, five ply felt and gravel roof, cement finish on floors, and reinforced footings resting on firm soil. This type was chosen for the first study as one that is well standardized in both general and detail construction and readily adaptable to practically all classes of light manufacturing and storage occupancy. It was hoped to make a similar analysis of a standard mill construction building in brick and timber, but time did not permit for the present paper, and this may be submitted at a later date.

DESIGN.

The slab design is based on the Chicago Building By-law Regulations of January 1st, 1918, with a slight modification of the bending moments in the slab justified by more recent analysis of the conditions. Columns and footings are designed according to the report of the American Joint Committee on Reinforced Concrete 1916. The above specifications were chosen as it was considered that on the whole they have met with a more general acceptance than any others available, although it must be admitted that the whole question of reinforced concrete design is still subject to refinement and development and it may be several years yet before we reach the same state of standardization and general acceptance as we have attained in the use of some other materials.

The working unit stresses and moment constants used are tabulated below.

Unit Stresses Employed

Footings

Pressure on soil	=	4 tons per sq. ft.
Punching shear on conc.	=	120 lbs. per sq. ins.
Tension on steel	=	16000 " " " "
Bond on steel (deformed)	=	100 " " " "

Columns

1-2-4 mix (unhooped)

Comp. on conc.	=	450 lbs. per sq. ins.
Comp. on steel (n = 15)	=	6750 " " " "

1-1-2 mix (hooped)

Comp. on conc.	=	1050 lbs. per sq. ins.
Comp. on steel (n = 10)	=	10500 " " " "

Slab and Beams (1-2-4 mix)

Comp. on conc.	=	750 lbs. per sq. ins.
Tension on steel	=	18000 " " " "
Diag. tens. on conc.	=	60 " " " " (on vert. sect. bjd)
Punch. shear on conc.	=	120 lbs. per sq. ins.
$n = \frac{E_s}{E_c}$	=	15

d = effective depth.

k = depth to neut. axis	=	0.384 d
j = centroid comp. to centroid tens.	=	0.872 d
Moment of resistance conc.	=	$126\ bd^2$
Moment of resistance steel	=	Area steel $\times$ 15700 d

MOMENT CONSTANTS

W = Total live and dead load on panel.
W_1 = Total live load only on panel.
L = Panel length c. to c. columns.

Type of Panel	Half panel width centered at column		Half panel width centered at mid-span	
	Neg. mom. over col. capital	Pos. mom. at mid-span	Neg. mom. over straight band	Pos. mom. at mid-span
Interior.....	WL / 30	WL / 75	WL / 125	WL / 125
Wall panel supported on conc. cols. and girders	WL / 30	WL / 60	WL / 125	WL / 100

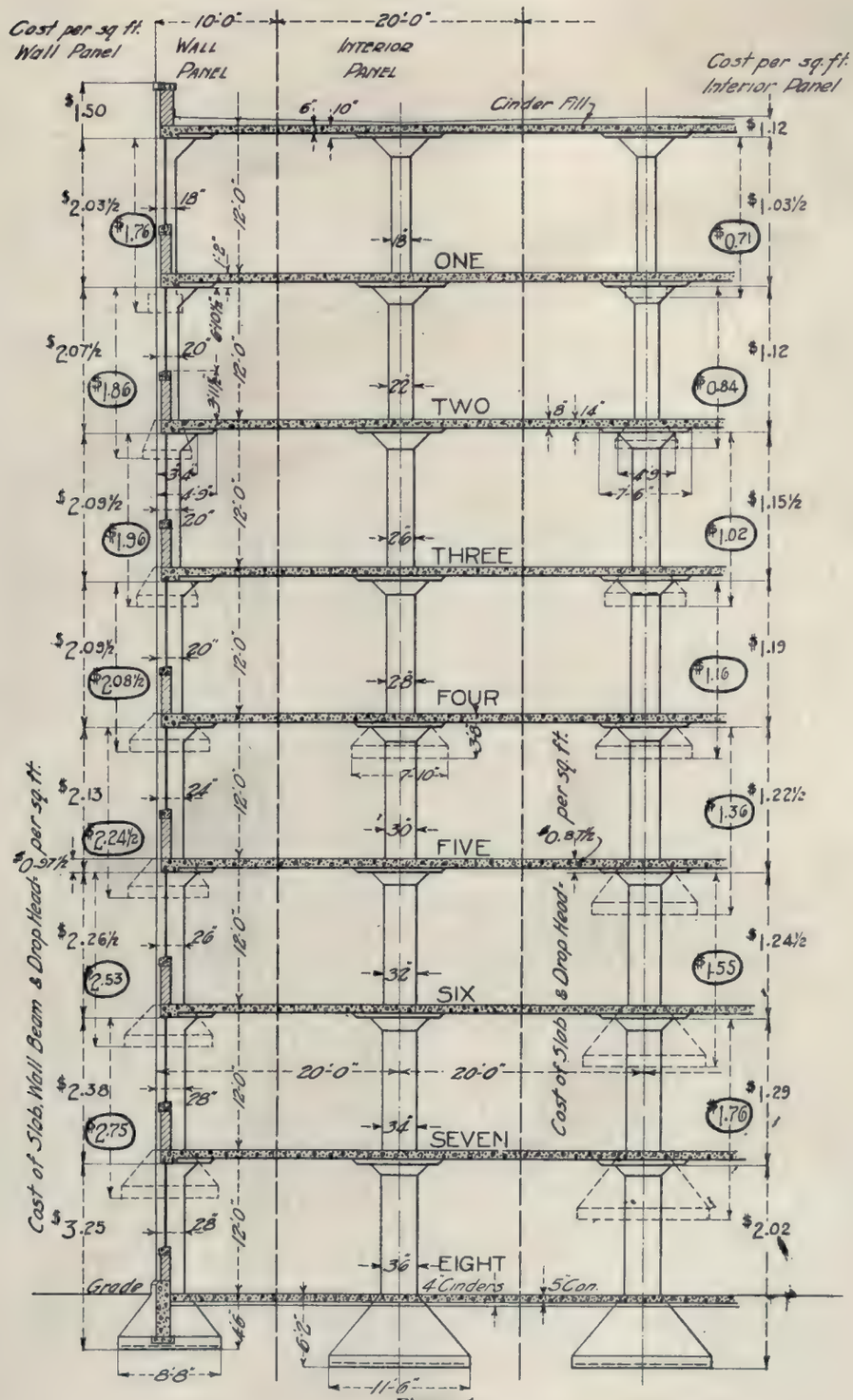
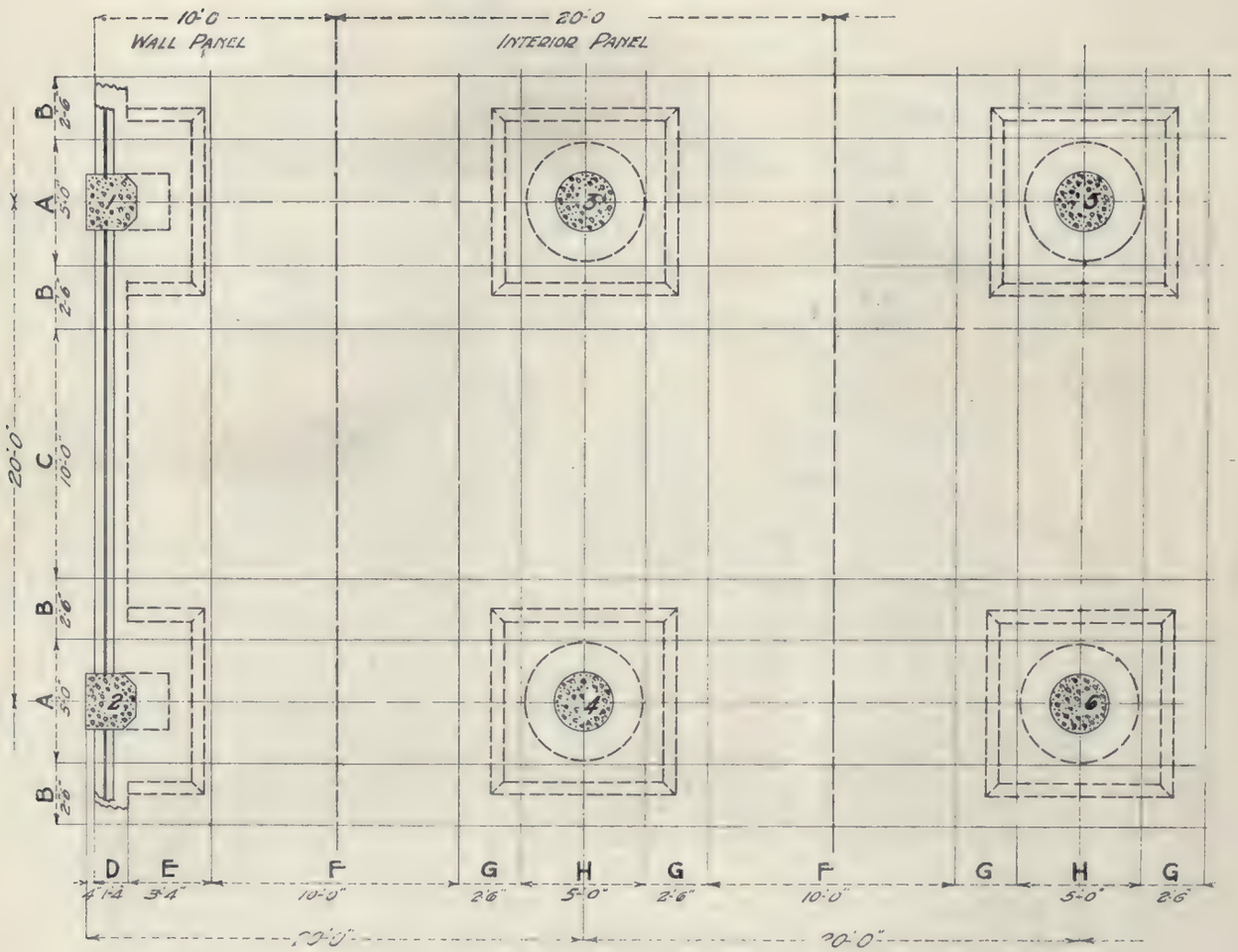

Cost per sq. ft. Wall Panel
10'-0"
WALL PANEL
20'-0"
INTERIOR PANEL
Cost per sq. ft. Interior Panel
Cinder Fill
ONE
TWO
THREE
FOUR
FIVE
SIX
SEVEN
EIGHT
Grade
4" Cinders
5" Con.
Cost of Slab, Wall Beam & Drop Head per sq. ft.
Cost of Slab & Drop Head per sq. ft.
8'-8"
11'-6"

Figure 1.



PLAN OF TYPICAL PANELS

DETAIL OF SLAB REINFORCEMENT — NOTE:- Z is total length of material in any Type

SLABS

Location of Panels by Columns	Thickness of Slab	Type of Rod	Number of Rods per Strip A	B	C	D	E	F	G	H	Y	X	W	O	S	T	U	Z	Size	Total No. per Panel	Weight
Wall Beam	14"	I				3					7'-8"	10"	11'-0"	28'-0"				28'-9"	7/8" ⌀	3	224
		Str't.				2												20'-0"	7/8" ⌀	2	104
Stirrups	14"					6												4'-0"	3/8" ⌀	6	10
1-2-3-4	8"	I					2	5	2	4	9'-10"	5½"	9'-6"	30'-1"				30'-6"	½" ⌀	13	264
		II	9	2	6							5½"		24'-7"	9'-10"	9'-6"	4'-4"	25'-6"	½" ⌀	19	323
		Str't.	2	2	7													16'-0"	½" ⌀	13	139
		Str't.	7	2														5'-6"	½" ⌀	11	40
		Str't.					2	6	1	1								13'-6"	½" ⌀	10	90
	Spacing		17 @ 3½"	6 @ 5"	16 @ 8½"	4 @ 2½"	4 @ 10	17 @ 10"	3 @ 10½"	9 @ 8½"											
3-4-5-6	8"	I	8	4	5			5	4	8	9'-10"	5½"	9'-6"	30'-1"				30'-6"	½" ⌀	34	692
		Str't.	2	2	6			6	2	2								13'-6"	½" ⌀	20	180
	Spacing		9 @ 8½"	3 @ 10½"	12 @ 10"			12 @ 10"	3 @ 10½"	9 @ 8½"											

Figure 2.

Moment Constants on Columns

Int. column carrying roof.....	$\frac{W_1L}{30}$
Int. column carrying floor.....	$\frac{W_1L}{60}$
Wall column carrying roof....	$\frac{WL}{30}$
Wall column carrying floor....	$\frac{WL}{60}$

METHOD OF ANALYSIS.

All costs noted represent total cost to the owner of the building. Except for the items of some of the individual elements, costs are expressed in relation to the square foot of floor area as it is believed that this gives a more useful and commercially applicable result than the cubic foot basis. Except for buildings of the one storey mill type where the cost of walls is a relatively large part of total cost, it is considered that cost figures based on floor area are a truer index than those based on cubic contents.

The unit prices used in compiling the tables and diagrams are tabulated below. They are based on tenders received for various buildings in Toronto in the fall of 1920. Of course with changes in the prices of materials and labor these unit prices would vary, but as the purpose of the present analysis is to show the *relative* not the *absolute* costs of the features considered, the unit prices are of secondary importance as long as their relation one to another is approximately correct.

Unit Costs Employed

Flat Slab Const.

6" to 9" Slab.	Con.	per cu. ft.	$0.540
	Steel	per lb.	.08
	Forms	per sq. ft.	.30
Cols. Conc. Per cu. ft.	1-2-4		.54
	1-1½-3		.59
	1-1-2		.64
Col. Forms,	drop		9.25 ea.
	cap		3.90 ea.
Per sq. ft.	square		.25
	oct.		.30
	round		.30

Concrete Floor Finish

Laid with slab	¾" thick	.072
Laid after	1½" "	.09
Brick spandrels	9" thick	.64 per super ft.
	13½" "	.88 " " "

Roofing, per sq. ft.	0.165
Flashing, per lin. ft.	0.465
Coping, per lin, ft.	0.465
Sills, per lin. ft.	0.35
Sash in place, clear glazed	.85 per sq. ft.
with wire glass	1.05 " " "

Ground Floor

Finish, per sq. ft.	$0.07
5" Conc., per sq. ft.	.23
4" Cinders, per sq. ft.	.08
Grading, per sq. ft.	.03
	.41

Footings

Exc.	3.00 per cu. yd.
Conc.	.50 per cu. ft.
Forms	.20 per sq. ft.
Steel	.075 per lb.

The results deduced will apply in a general way to several other types of building, but as these other types are usually more specialized for some particular occupancy they are not susceptible to the same detailed analysis as the type above described.

A typical section of one building has been worked out in detail and by the use of the diagrams corresponding cost items may be found for other buildings of different heights, panel sizes and floor loadings. The building chosen for detailed study has panels twenty feet square, live load on floors of two hundred pounds per sq. foot, a storey height of twelve feet and is eight storeys high. A partial cross section and floor plan with some particulars as to reinforcement, etc., are shown in Figs. 1 and 2.

FOOTINGS.

The cost of footings, including excavation, has been computed in relation to the column

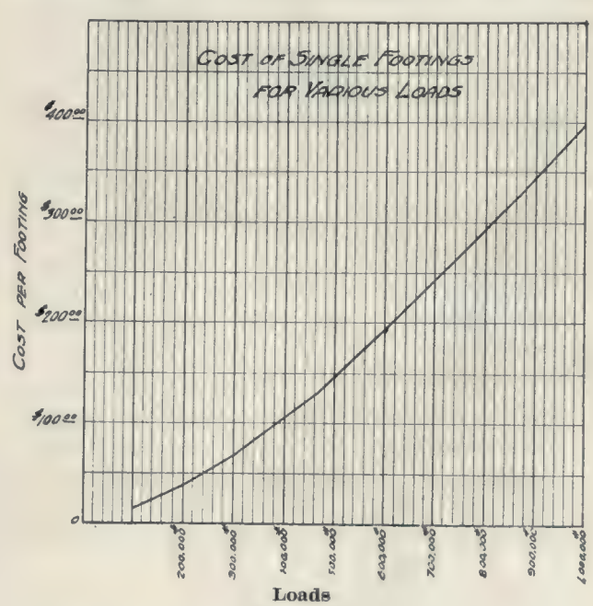
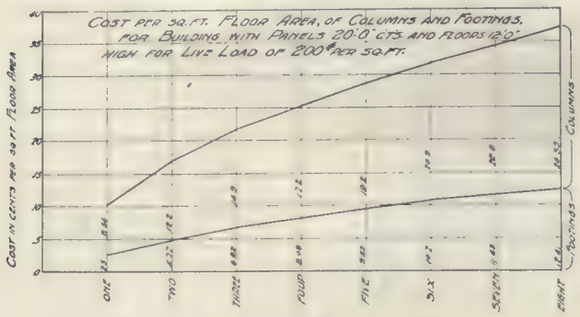


Figure 3

load. Fig. 3 shows these costs in terms of total cost of single footings for a given column load, and Fig. 4 shows them combined with columns

in terms of cost per square foot of floor carried. It was found that except for the very light loads the depth of footing was determined by the unit stress in punching shear, which was measured on a cylinder of the perimeter of the column.



Number of storeys

Figure 4.

Bond stresses were figured from vertical shear and necessitated the use of rods smaller than base price sizes up to column loads of about 850,000 lbs. Some discussions which have appeared in the technical journals since the preparation of these diagrams might justify the use of a truncated cone section instead of a cylinder as the criterion for punching shear, and permit of a more even distribution of bond stress over the length of the rod. Both these points would tend to reduce the cost of the footings somewhat.

COLUMNS.

A comparison of the relative values of different types of columns was made to show definitely the advantage of using a hooped column and a rich mix. This is based on twenty-four inch columns with one per cent. longitudinal steel and hooping equivalent to one per cent. of the volume of the enclosed concrete. The concrete outside the steel is not considered as effective section. Costs are stated in terms of the cost in cents, of carrying a load of one thousand pounds a vertical distance of one foot. The weight of column is given in the same terms.

These tabulations, given below, show the economic value on using hooping and a rich mix, particularly in a high building, where the weight of the column itself will be an important item as the lower storeys are reached. This table shows that for a given load carrying capacity the type of column that a few years ago was considered standard, not only costs 71 per cent. more than the minimum type, but also weighs more than twice as much. It also shows, by means of the items for an additional one per cent. of longitudinal steel, the relative extravagance of using more steel than the allowable minimum.

The item of cost for the additional one per cent. of longitudinal steel is the cost per 1,000 lbs. for the *additional* load which the more heavily reinforced column is capable of carrying.

Of course the necessity of keeping columns within a reasonable size, and, in some cases, the provision for bending moments, will frequently make it advisable to use more than the minimum of steel. In one building for which the general cost amounted to about $2.50 per square foot it was found that the addition of sufficient steel to keep the maximum column size down to twenty-four inches amounted to $20.00 per square foot of floor space gained.

Cost of Columns of Various Types

Type	Mix	Weight per ft. per 1000 lbs. carried	Cost per ft. per 1000 lbs. carried	% of min'm. cost
24" dia. Round Hooped Long Steel = 1%	1-1-2	1.27 lbs.	1.58 cts.	100
	Add.1% steel		2.7 cts.	
	1-1½-3	1.49	1.81	114.6
	Add.1% steel		2.66	
	1-2-4	1.81	2.15	136.0
	Add.1% steel		2.61	
24" sq. Ties at 12" ctrs. Long Steel = 1%	1-1-2	2.04	1.95	123.5
	Add.1% steel		4.2	
	1-1½-3	2.40	2.21	140.0
	Add.1% steel		4.12	
	1-2-4	2.95	2.70	171.0
	Add.1% steel		4.05	

There are cases, such as some wall columns or columns that for architectural reasons are rectangular, where it will not be economical to use hooping, but these are special, and each case should be considered for its special requirements.

SLABS.

For purposes of comparison a table has been compiled showing the cost per square foot of slabs composed of various concrete mixes, see table below. This table is based on a slab or beam designed for a given live load, and as the dead load increases with the greater depth of slab required for the leaner mixes the total bending moment increases correspondingly.

An application may be made of the tables to find at what height above footings it would pay to use a richer mix for the slab than the normal 1-2-4.

Consider a panel 20 ft. square, area 400 sq. ft. A slab of 1-1½-3 mix would cost 400 × 1.1 cts. = $4.40 more than one of the same strength in a 1-2-4 mix, but would weigh 400 × 8 = 3,200 lbs. less. The saving in column cost per foot of height would be 1.58 × 3.2 = 5.06 cts. So at a column height of $\frac{440}{5.06}$ = 87 ft. the saving in column cost would balance the higher slab cost, and at any height above this there would be

some economy in using the richer mix for the slab.

APPLICATION TO COMPLETE BUILDING.

The curves of Figs. 5 and 6 represent costs computed for what may be considered an average type of building as illustrated by Figs. 1 and 2. These curves cover the range of probable variations in width and number of storeys.

Cost of 1 Sq. ft. of Slab Designed for B.M. from L.L. of 200 lbs. per sq. of 30,000 ins. lbs. on strip 12" wide.

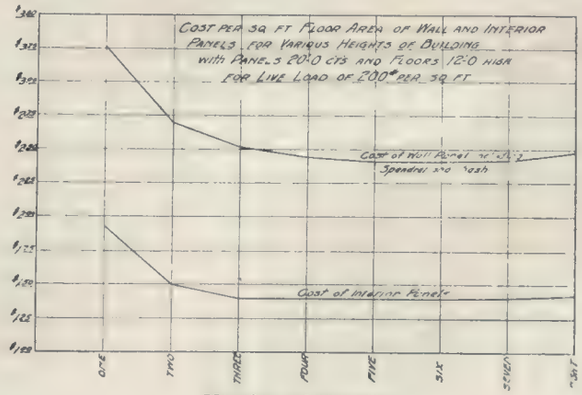
Mix	Total B.M. LL + DL	$d = \frac{BM}{12\ RMc}$	Wt. of slab per sq. ft.	Concrete in cu. ft.	Steel sq. ins.	Conc. + steel	Finish and forms	Total cost in cts. per sq. ft.	% of min. cost
1-3-6	30000 16500	7.85 (+ 1")	110 lbs.	0.74 @ 48c	0.376 @ 27c				
	46500			= 35.5	10.2	45.7	37	82.7	105.2
1-2½-5	30000 13500	6.35 (+ 1")	92 lbs.	0.61 @ 50c	0.425 @ 27c				
	43500			= 30.5	11.5	42.0	37	79.0	100.6
1-2-4	30000 12000	5.27 (+ 1")	78 lbs.	0.52 @ 54c	0.505 @ 27c				
	42000			= 28	13.6	41.6	37	78.6	100
1-1½-3	30000 10500	4.65 (+ 1")	70 lbs.	0.47 @ 59c	0.56 @ 27c				
	40500			= 27.6	15.1	42.7	37	79.7	100.7
1-1-2	30000 9500	4.20 (+ 1")	65 lbs.	0.433 @ 64c	0.605 @ 27c				
	39500			= 27.6	16.3	43.9	37	80.9	103.0

They are prepared from the amounts shown on Fig. 1 which, it will be noted, are in two series. The items on Fig. 1, enclosed in the rings represent the square foot cost for each tier when it becomes the lowest storey of the building, while the unenclosed items are for the tier when it is an upper storey.

The method of computing these items was first to work out the actual costs of an eight storey building. Then for each floor in turn the saving in floor slab construction is deducted, and the footing cost is added, to arrive at the unit cost when the floor in question is considered as the ground floor. Thus to arrive at the average cost of, say, the wall panel of a four storey building we add together the unenclosed figures for roof, one, two and three storeys and the enclosed figure for the fourth or ground floor totalling $9.79. Divide the sum by the number of storeys, four, and we have the average cost per square foot, equals $2.45.

The wall panel has been considered as extending only to the mid-span. This gives a convenient arrangement, as then an interior panel may be considered as the area centred on a single column, and any number of interior panels may be added to two wall panels to produce the total for any width of building. In the costs for the wall panels are included the costs of the extra steel in the slab required for the greater bending moment, the wall beam, the brick spandrel, and the sash.

The cost per sq. ft. of a corner panel, which has an area equal to one-half that of an ordinary wall panel, but a wall length and column cost equal to that of a wall panel, will be very nearly the same as the sum of the wall and interior panel costs for the corresponding floor. Thus for a four storey building the square foot costs of fall and interior panels taken from Fig.



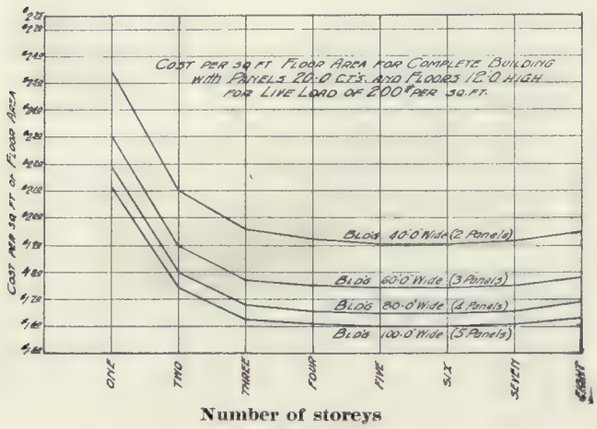
Number of storeys
Figure 5

5 are $2.45 and $1.40 respectively. The sum of these gives us $3.85 per sq. ft. The area of the corner panel will be 10 ft. × 10 ft. = 100 sq. ft.

per floor, and this item may be added to the amounts made up from complete wall and interior panels to get the total for the whole building.

The applications of these curves may be made clearer by consideration of a practical case.

An owner requires 256,000 sq. ft. of space for light manufacturing, of which he wants one half built at present and the remainder at some future date. The building has unobstructed light



Number of storeys

Figure 6

from both sides and so may be fairly wide, say 80 ft. 0 in. Compare two possible solutions.

Case I—Building 80 ft. wide, 400 ft. long, four storeys high, designed for a future addition of four storeys.

Case II—Building 80 ft. wide, 200 ft. long, eight storeys high, with provision for an extension at one end of 200 ft. long.

For Case I we shall have to go back to the table of unit prices for the items of parapet and the temporary roofing and fill. The cost of the top floor slab without finish, columns or walls, and the items for interior and wall panels for the one, two, three and four tiers, counting from the top, will be found on Fig. 1. The two cases may then be tabulated as follows:

Case I

Roofing	960 lin. ft. parapet	@	$2.38	=..	$2,284.80
	960 lin. ft. flashing	@	.46	=..	441.61
	32000 sq. ft. roofing	@	.16½	=..	5,280.00
	32000 sq. ft. fill	@	.20	=..	6,400.00
					$14,406.40

Tiers	Costs in Panels		
	Interior	Wall	Corner
Top.....	$ 0.87½	0.97½	1.05
One.....	1.22½	2.13	3.35½
Two.....	1.24½	2.26½	3.51
Three.....	1.29	2.38	3.67
Four.....	2.02	3.25	5.27
Totals.....	$ 6.65½	11.00	16.85½
×			
Area.....	22800	8800	400
Amount...	$151734.00	$96800.00	$6742.00

Total for floors (everything below roofing)	255,276.00
Total for building	$269,682.40
Total area 128,000 sq. ft.	
Cost per sq. ft. = ...	$2.10.7

Case II

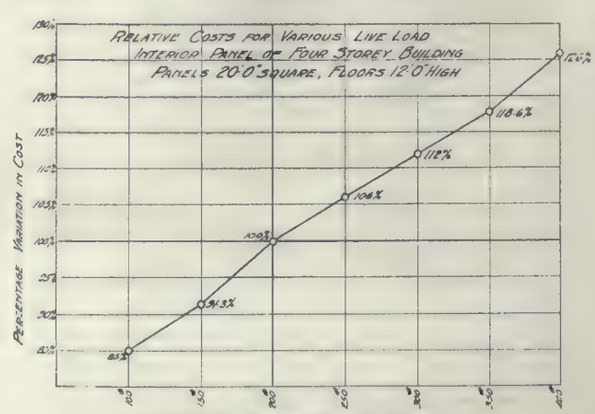
With the exception of the end wall panels this may be taken directly from Fig. 6 where we find the cost for an eight storey building 80 ft. 0 in. wide to be $1.69 per sq. ft.

Floor area, omitting end wall panels is	
80 x 180 x 8 = 115,200 sq. ft. @ 1.69.....	$194,688.00
6 end wall panels give an area of	
10 x 20 x 6 x 8 storeys = 9600 sq. ft. @ 2.48=..	23,608.00
And 4 corner panels give	
10 x 10 x 4 x 8 storeys=3200 sq. ft. @ 3.90½=	12,496.00
Total cost	$230,792.00
Total area 128,000 sq. ft.	
Cost per sq. ft. =.....	$1.80

Thus it is found that Case I will cost over 30c. per square foot or nearly 17 per cent. more than Case II. Another point to be considered is that the roofing on Case I will have to be discarded before having given full service if the addition is made in a few years, while in Case II it will probably be desirable to retain the end wall as a fire wall even when the addition is made.

EFFECT OF LIVE LOAD ON COST.

Fig. 7 show the effect of variation in live load on the cost of a typical interior panel, including columns and footings, in a four storey building. It will be noted that the relative costs are given in percentages referred to the typical building



Live load, per square foot

Figure 7

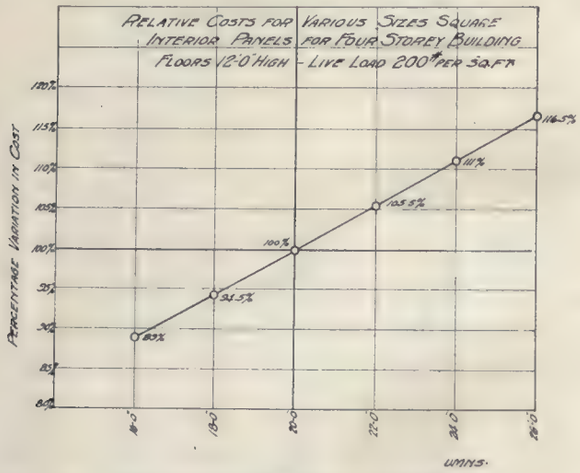
shown in Figs. 1 and 2 and for which we can get dollars and cents costs from Fig. 6.

It is interesting to note what a relatively

small increase in costs is caused by a large increase in load carrying capacity.

EFFECT OF VARIATION IN PANEL SIZE.

Fig. 8 shows the effect of variation in panel size on the cost for interior square panels, including columns and footings. The percentages on this Figure are also referred to the costs on Fig. 6.



Side of square panel C to C Columns
Figure 8

By the use of Figs. 6, 7 and 8 it is possible to compare the cost of any probable combination of length, width, and number of storeys for the type of building considered, and find without great labor, the most economical solution of the problem of supplying an owner with a given amount of floor area. Or they may be applied to balance the cost of various solutions against other considerations, such as the cost of land available, the size and usable area of the lot, architectural considerations, effect of width on natural lighting and so on.

As stated earlier, the dollars and cents costs may not be of direct application, owing to the continuous variation in material and labor prices, and the eagerness or otherwise of contractors to take on a job, but it is hoped that the *relative* costs may be of some use to others as they have been, in a cruder form, to the writer.

O. A. A. Notes

A meeting of the executive of the Ontario Association of Architects, held on February 5, at Windsor, Ont., approved the suggestion made by the Toronto Chapter that a standard sign be adopted, to be displayed by members of the Association on buildings erected under their supervision. The sign is to be in black and white, the wording to be limited to the firm's name and address and the term "Registered Architect," and the letters not to exceed 4 inches in height.

The meeting was held in accordance with the decision of the London convention last fall, authorizing that council meetings be held in several of the more important cities in the province, President H. E. Moore being in the chair, with Messrs. Hynes, Kelly, McGiffin, Page, Watt, West and Wickson of the council in attendance.

The president reported the result of the interview with Premier Drury, on February 3, with reference to an amendment to the Ontario Architects Act, the Toronto members of the council being appointed a committee to go into the matter of the various points required for a draft bill to incorporate, among other things, (a) protection for the word "Architect;" (b) a provision requiring alien architects to associate with Canadian practitioners; (c) a government licensing system for architects; (d) improved facilities for education.

Other matters before the meeting dealt with the passing of accounts, and the question of eligibility for separate membership in the R.I.A.C., it being understood by the council that membership in the R.A.I.C. definitely implies membership in a Provincial association.

The following were admitted to membership:

H. Bryan Gilbert, Albert H. McPhail, James Carlisle Pennington, David W. F. Nicholls, all of Windsor, Ont.; D. Jerome Spence, Montreal; Edward T. Stevens, Boston, Mass.; F. W. Warren, Hamilton; Willard Bruce Riddell, Hamilton; Thos. Raybould Wilks, Sault Ste. Marie.

Associate Members:

Frank Willougby Nicolls, Brantford; Lester Husband, Hamilton; Bryan D. S. Chadwick, Toronto; McKenzie Watters, Toronto.

Authority was also given to the Advertising Committee to spend up to the sum of $1,000, providing funds are available.

Toronto Chapter Activities

A committee consisting of Messrs. Somerville, Shepard and Warrington, has been appointed by the Toronto Chapter, to draw up a tentative scheme for an architectural exhibition, with instructions to report at the next meeting.

The Chapter has also decided to assist the Draughtsmen's Association in their efforts to establish an atelier—the present committee, composed of Messrs. Cobb, Shepard and Somerville, with the addition of Mr. Lyle, being appointed to act in this connection. The intention is to assist the draughtsmen to secure drawing boards and other necessary equipment, and by arranging for personal instruction and criti-

cism of projects by individual members of the Chapter.

A feature of the next meeting will be a discussion led by Mr. C. S. Cobb, on the subject of "General Contractors doing Their own Designing."

Mr. Stamford Warrington was elected treasurer of the Chapter for the ensuing year.

Hamilton Architects Elect Officers

The first annual election of officers of the Hamilton Chapter of the Ontario Association of Architects took place on January 15, with the balloting resulting as follows:—President, Gordon Hutton; vice-president, Stanley T. J. Fryer; executive: Wm. J. Walsh, B. Frank Kelly, Louis O. Secord; secretary, Geo. T. Evans; treasurer, E. T. Rastrick.

A majority of the architects of the city were present and evinced a keen interest in the matters pertaining to the profession and ways and means were discussed whereby the association could make itself of greater value to the community in its architectural development. Many valuable suggestions were presented which will be taken up by the executive in the near future.

At a second meeting, held on February 15, addresses were delivered by John W. Greig and Stanley F. J. Fryer. Mr. Greig was the first speaker and he presented a very instructive talk on "Present Building Costs," stating that there had been a decrease of ten per cent. over peak prices of last year. Prices, however, were still higher than in February, 1919. The only hope of lower prices this spring lay in the chance of the various trades getting back to the pre-war basis of production. It depended on the artisans.

Stanley B. Fryer gave an address on "The Canadian Battlefields' Memorials," in which he outlined the intention of the Canadian Government with regard to the placing of eight great monuments at points in the battlefields of France where the Canadian armies were operating.

The Chapter is arranging a program for future meetings, embracing some of the best speakers on architecture and building in the province. Among these will be Herbert E. Moore, president of the Ontario Association of Architects, and J. P. Hynes, both of Toronto.

The meetings will be held monthly on the second Monday of each month, at the Royal Connaught Hotel, when all matters relating to the profession will be fully discussed.

P. Q. A. A. Elect Officers

At the annual meeting of the Province of Quebec Association held at Montreal on January 15, the following were elected to office: President, J. E. Vanier; 1st vice-president, Eugene Payette; 2nd vice-president, L. A. Augur; secretary, Joseph Perrault; treasurer, R. Foster. Councillors: Herbert Raine, D. H. MacFarlane, Jos. P. Ouellet, Ernest Cormier, J. Cecil McDougall. Delegates to the Royal Architectural Institute of Canada; Alcide Chausse, J. S. Archibald, D. R. Brown, J. P. Ouellet, Prof. Ramsey Traquair.

The report of the council deplored the failure of the Government housing scheme and expressed the hope that some definite action would be taken during the coming year. The council took an optimistic outlook as to the immediate future, believing that the lowering of prices was doing much to restore public confidence and that this would exert an influence on building construction.

Tribute was also paid to the work done by Mr. McEvers, the winner of the last scholarship, and it was urged that the scholarship be made a permanent feature.

Other matters discussed by the meeting was the ten years liability clause affecting architects and contractors, and the question of architects' fees. It was suggested that a campaign be started with a view to more fully acquainting the public with the regular schedule of professional charges, together with the benefits which accrue in securing the service of a duly registered architect, instead of an unauthorized person, when architectural services are required.

Canadian Stone and Battlefield Memorials

The Canadian Paving Block and Manufacturers Quarries Association have petitioned the Hon. Mr. Newburn, Chairman of the Canadian Battlefields Memorial Commission, urging that Canadian stone be used in the proposed monuments for which the commission is inviting tenders. The claim of the association is that a large portion of the cost of such memorials would be paid out in labor and that by using Canadian stone and having same cut in Canada, employment would be given to a good number of men; also that the Canadian stone is superior to the European variety which it is proposed shall be used. Canadian granite in particular can readily commend itself for the purpose mentioned and if utilized for the proposed memorials would represent a material equal to the best to be found anywhere both as regards weathering qualities and texture. The claims put forth are to say the least valid ones, and will undoubtedly be given favorable consideration before any final choice of materials is made in carrying out the work in question.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:

MONTREAL—171 St. James Street.
C. S. Soutter, Representative.

WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue.
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, Feb. 1921 No. 2

Ontario Town Planning Conference

Why do our city councils and legislative bodies refuse to recognize the economic value of town planning, and why should town planning struggle for acceptance, as did medical health work, when it will render a service equal in importance to the community as that which medical health work is now rendering? In view of the provincial town planning conference just held at Toronto, we might well ask these questions, for anyone who has given thought to the subject, fully realizes that legislative and civic administrators have already too long delayed in applying the science and economy of town planning to existing needs. In a word, town planning means the efficient administration and proper co-ordination of all measures affecting municipalities. It means foresight and attention as to future requirements, the elimination of slums, the restoration of deteriorated mid-central property values, and the systematic and supervised growth of all physical elements, including transportation, entering into community life. In brief, it means working to a plan, instead of a hap-hazard development. It therefore represents a matter of utmost concern to both legislative and civic authorities and implies the need of legislative enactment to put the principles of town planning into operation.

In many instances municipalities are sensible of the disadvantages under which they labor, but are unaware that town planning is the remedy for their ills, while others that recognize its benefits are handicapped owing to the lack of existing machinery to carry it into effect.

The difficulty lies in the fact that the methods employed to deal with modern requirements are ineffective and antiquated. Perhaps this will be more fully grasped when it is realized that within the past forty years the urban population has increased over 600 per cent. as compared with less than 3 per cent. in the rural districts, and that these urban municipalities are struggling with this enormous expansion with very little change in their administrative machinery to what they had when they were mere villages compared to what they are at present.

What is mainly required is legislation making it necessary for all cities in the province to undertake the preparation of a city plan, such as was recommended in the memorial presented by the conference to the Ontario Government. Legislation of this character, if granted, would not only affect economy in civic expenditure, but would result in a greater foresight with respect to urban development.

The formation of the Town Planning Institute of Ontario, which came into being as the result of the conference, will direct new efforts toward this end. Its object will be to harmonize the ideas and activities of its members and to secure those facilities which are lacking to-day to make town planning effective.

Moreover, it is gratifying that the first president of the Institute should be an architect. While it is but natural that architects should be town planners, too few of them have given it the study it deserves. Town planning on purely engineering lines would give us cities lacking in the aesthetic character which the architect is so well qualified to give. It must necessarily represent the collaboration of both professions, and is a field of endeavor in which qualified men will, in a few years time, find a special opportunity for exercising their art and skill.

Annual Meeting Manitoba Architects

A large, enthusiastic attendance marked the annual meeting of the Manitoba Association of Architects, held on January 24. In giving his address of welcome, the president outlined the activities of the council during the past year, which included the ratification of architectural scale of charges by the Provincial Government, the settling of a code of ethics and code governing the conduct of architectural competitions, establishing a definite standing for architectural practice. He stated that negotiations were under way with the University of Manitoba whereby, acting in conjunction with the Association, the University were to take charge of examination of architects wishing to establish themselves in the profession. One of the important items discussed was the question of the obligation of the architect to the junior draughtsman. It was felt that something would have to be done to assist those members desiring to get into the profession who are financially or otherwise unable to attend the University. The matter was left over to the new council to deal with. An interesting report was furnished by Professor Stoughton on the work of the Department of Architecture, University of Manitoba. The Royal Architectural Institute of Canada having expressed their desire to hold their annual convention in Winnipeg during the coming year, an enthusiastic invitation was extended by the Association to the Institute in this connection. A good financial standing was reported by the treasurer.

Mr. J. N. Semmens was elected president for the coming year, and Mr. J. W. Smart vice-president, the following being members of the Architectural Council: Mr. C. C. Chisholm, Mr. C. W. Chivers, Mr. A. E. Cubbidge, Mr. L. H. Jordan, Mr. G. W. Northwood, Mr. E. Prain, Mr. J. S. Schofield; Mr. E. Fitz Munn, secretary-treasurer.

Condulet Equipment

The Crouse-Hinds Company, Toronto, have just issued "Bulletin 1000N," dealing with their Mogul Obround Series of condulet bodies. These bodies are made in eight sizes, each type ranging from one to four inches. Though liberal in their proportions, they do not materially effect the general outline of the conduit system. The hubs have integral bushings and tapered threads. There are four sizes of composition and cast iron covers, each size being common to two sizes of Mogul condulet bodies. The composition covers are made with from one to nine wire holes; also blank, which can be drilled by the user as required. The bulletin gives full information as to sizes and prices, with illustrations of the various type of bodies listed.

Ontario Town Planners Elect Officers

Officers of the newly formed Town Planning Institute of Ontario, elected at the Town Planning Conference held February 17-18 at Toronto, are as follows:

President, Mr. J. P. Hynes, Toronto; first vice-president, Mr. T. S. Norris, Hamilton; second vice-president, Mr. T. E. Harley, London; third vice-president, Mr. W. H. Breighthaupt, Kitchener; fourth vice-president, Ald. E. D. Lowe, Ottawa; secretary, Mr. W. S. B. Armstrong, Toronto; treasurer, Mr. Gordon Philip, London; auditors, Mr. Frank Beer and Ald. Mrs. Hamilton, Toronto.

The Executive Committee appointed is as follows:—Ald. Mrs. Hamilton, J. P. Hynes, W. S. B. Armstrong, G. Frank Beer and W. E. Turley, Toronto; J. J. McKay and T. S. Morris, Hamilton; Ald. H. E. Rose, St. Catharines; Mayor F. H. Plant and Ald. E. D. Lowe, Ottawa; Ald. Frank Harley and Gordon Philip, London; W. H. Breighthaupt, Kitchener; Frank Cockshutt, Brantford; R. W. Gladstone, Guelph; J. P. Jaffray, Galt; F. Howard Annes, Whitby; F. Maclure Sclanders, Windsor; Major A. W. Deacon, Stratford; J. M. McAdams, Sarnia, and F. Carr, Oakville.

Next year conference will be held in Hamilton, Ont.

Ornamental Iron and Bronze Foundry

Mr. J. Harlander, former superintendent of the Canada Foundry Company, and who for twelve years was with the ornamental iron and bronze department of Jno. Williams, Inc., of New York, has assumed the management of the Ornamental Iron Products Company, Toronto, a new concern located at Gladstone and Trafalgar Avenues, which is operated by the W. S. Mahaffy Company. The company employs a staff of competent artisans and is excellently equipped to tender on and execute all classes of bronze and ornamental iron work.

Evolution of Architecture

Continued from page 53.

sustained development. The necessary central idea, however, may be near at hand, either in the ascendancy of commercial power or in the exaltation of a new national idea. The great period of Greek architecture was due to the exaltation occasioned by the victories of Marathon and Salamis. We may now be in the position of one who has passed through an exhausting struggle, recovering our powers to be later succeeded by the flush of achievement from which will emerge a national idea capable of a sustained and progressive expression in architecture. The verdict at any rate will lay with future generations, for art development, to be judged correctly, requires long perspective.

Toronto, March, 1921 Vol. XIV., No. 3

CONTENTS

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG 67
By Prof. A. A. Stoughton, Department of Architecture, University of Manitoba.

MECHANICAL EQUIPMENT, NEW MANITOBA PARLIAMENT BUILDING 77
By S. S. Kennedy, Consulting Engineer.

ECONOMICS OF TOWN PLANNING 80
By Naulon Cauchon, A.M.E.I.C., M.T.P.I.C., M.A.C.P.I.

WHY HOUSES ARE NOT BUILT 86
By Thomas Adams.

BUNGALOW OF C. P. MEREDITH (ARCHITECT), OTTAWA 88

O. A. A. NOTES 90

EDITORIAL 91

Full Page Illustrations

NIGHT ILLUMINATION OF DOME, NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG 66

ANTE HALL, LOOKING NORTH, NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG 72

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

Copyright Photo, Courtesy Travers Sweatman, K.C.

NIGHT ILLUMINATION OF DOME.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG, MAN.

FRANK W. SIMON, F.R.I.B.A., ARCHITECT.

The New Manitoba Parliament Building

By Prof. A. A. Stoughton, Department of Architecture, University of Manitoba.

THE plans of the new Manitoba Parliament Building were selected by a competition open to all architects practicing in the British Empire. The conditions of the preliminary competition were published in December, 1911, and 67 sets of sketches were submitted in the spring of 1912, from which the designs of five competitors were selected for further competition. Leonard Stokes, F.R.I.B.A., past president of the Royal Institute of British Architects, acted as assessor. The successful design in the final competition chosen by the assessor was that of Frank Worthington Simon, F.R.I.B.A., which was confirmed by the Lieutenant-Governor of the Province of Manitoba, in Council in the fall of 1912.

As a piece of architecture in which elegance and dignity are linked to utility and sound construction enhanced by a comprehensive treatment of sculpture and painting, the completed building stands as a notable monument. Both in its site and setting it is admirably placed. The grand mass of the block of the lower part, severe in style, but varied in perspective by projecting wings and porticos, rises from the ground to the vast upper platform on which the high structure, terminating in the dome, is set. The style is Classic, strongly Greek in character. The colonnade is admirably treated, being strong and dignified. Majestic Ionic columns 40 feet high and 4 feet 9 inches in diameter supporting the entablature and pediment filled with sculpture, form the front portico. The walls are simply treated almost to bareness, the small amount of detail and the texture of the stone relieving it just enough. The entablature runs around the whole building, coupling together the porticos on the three other facades with the great entrance colonnade, and also the Ionic columns. Above and beyond the great dome rises, a feature belonging not to Greek times, but to the re-birth of classic architecture in the sixteenth century. The pinnacle of the dome at a height of 240 feet is crowned by an airy running figure, in bronze, gilded, typifying the youth of Manitoba, extending the torch and bearing a sheaf of wheat on his left arm. From every side and angle the building composes well.

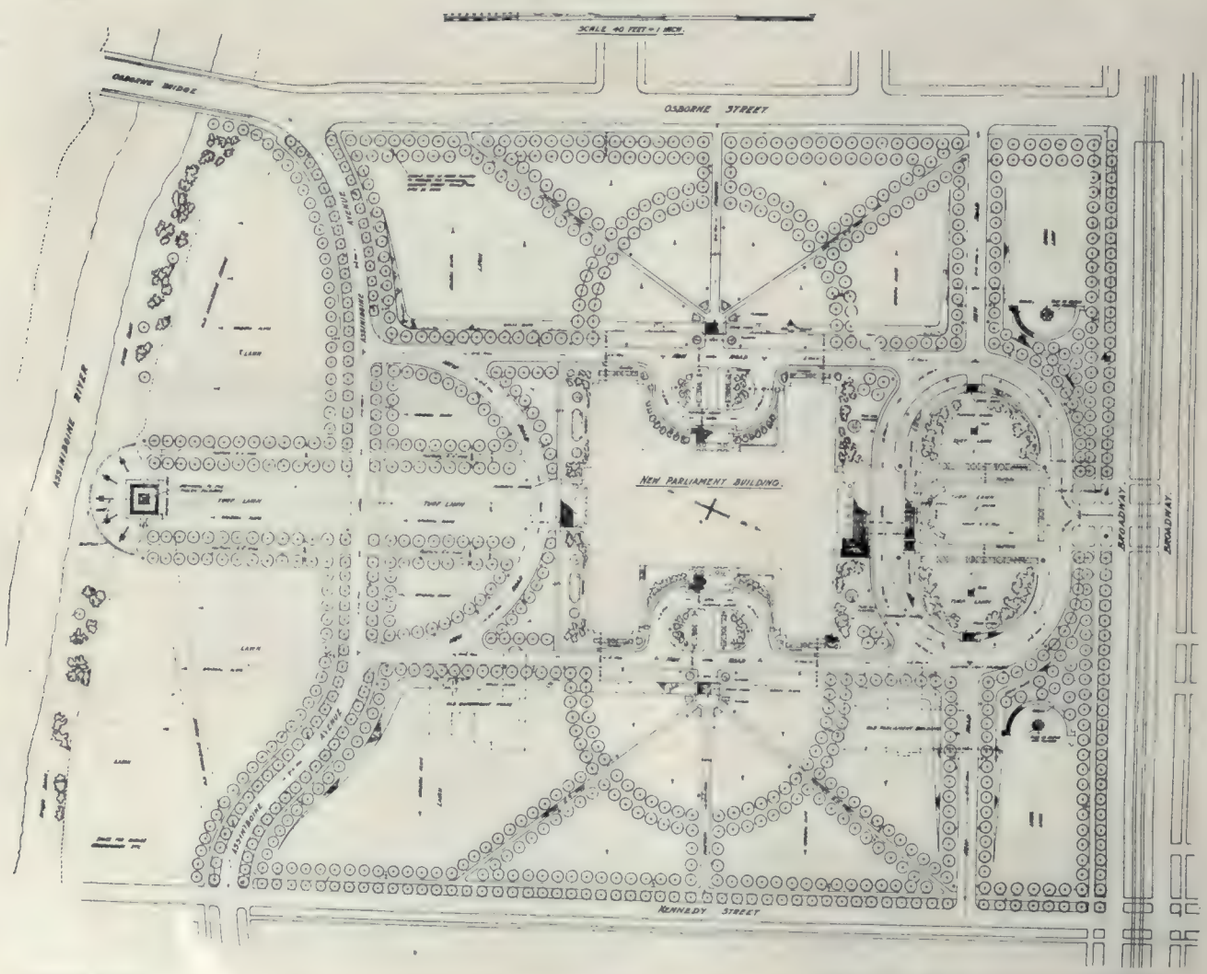
DESCRIPTION OF PLAN.

In plan the building assumes the shape of a letter H, the arms of the H extending east and west and containing the departments and working spaces. The middle bar of the letter is occupied by the great monumental rotunda, which the dome surmounts, the entrance portico and vestibules and grand staircase leading up through this rotunda to the legislative chamber with all its dependencies, on the second storey. The main public and ceremonial rooms are on this level, grouped in the central portion. These are the Lieutenant-Governor's room, the state reception room and museum, the executive council chamber, the Premier's office, and the law amendments committee room and library.

Side entrances, opposite the rotunda, lead out

Copyright Photo, Courtesy Travers Sweatman, K.C.
DETAIL OF DOME.

VIEW FROM NORTHWEST.



BLOCK PLAN.

FRANK W. SIMON, F.R.I.B.A., ARCHITECT.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG, MAN.

through smaller porticos into the courts, enclosed on three sides. Up to these entrances, guarded by seated figures in stone of the great men of the past, sweep semi-circular drives between parapet walls. At the middle south front another portico gives entrance to those who approach from Assiniboine avenue in its changed position. Despite the multiplicity of parts and service, the plan is simplicity itself, and anyone can easily find what he desires. Broad corridors 300 feet long run from end to end of the two wings or arms of the H, and two corridors, also about 300 feet long, connect these, running through the bar of the H and enclosing the grand-stair and chamber. At the four corners of the bar of the H are staircases and elevators which are thus well distributed for the convenience of access.

Local Tyndall stone, which forms the entire exterior surface of the walls, is also used with fine effect in the interior treatment. In the vestibule, as one enters, Greek Doric columns form the supporting members, and going further into the rotunda, under the dome, there is a fine Corinthian order of eight columns in pairs at the four corners. This great chamber, 64 feet in diameter and 84 feet high, is lighted by the great arched windows visible from without, in the base of the dome. There is necessarily a great height between the inner and the outer domes, the elevation of the latter being governed entirely by its exterior appearance and its function as a crowning feature for the very large mass of the building. The Greek character is further apparent in the criss-cross balustrades, in the wave ornaments in the segmental hall ceilings, in the Pompeian lighting fixtures, in the mouldings of the staircase, in the furniture, the whole resulting in a modern building bound together and unified, but unhampered by a congruous classic treatment throughout.

STAIRCASE AND ROTUNDA.

The staircase hall, with its fine simple treatment and ample dimensions, is truly monumental, and forms an appropriate setting for a state ceremony, where the galleries at each upper level give ample space for spectators looking down upon the procession or group of guests passing up toward the rotunda or legislative chamber or reception room. The start of the staircase, which is 20 feet wide in three runs, is guarded by two enormous bisons in bronze, and above in the third story are four female figures supporting the upper cornice. It is lighted by day by the large skylight and by night by luminous bowls on Pompeian iron tripods.

Copyright Photo, Courtesy Travers Sweatman, K.C.
EAST PORTICO.

The rotunda forms the ante-hall to the legislative chamber, and the painting by Brangwyn will decorate the arch above the entrance to the lative chamber, and a painting by Brangwyn of a horseshoe. It consists of a main floor, sunk in the centre, with surrounding tiers on which members' chairs and desks are placed. The speaker's chair is in the centre of the apse at the south end of the chamber, in which is placed the reporters' gallery. Public galleries seating 300 are provided in great niches. It is a lofty room, with coved ceiling and skylight, the daylighting being all from above. The deep blue carpet, the black marble borders, the ebony-inlaid walnut woodwork, the gilt bronze lighting standards, and, above all, the bronze figures of Moses and Solon, and the beautiful mural paint-

ings on the walls and ceilings make this room a high artistic achievement.

The members' writing room is to the south. It is simple in treatment, with gray and white walls, walnut mantel, marble borders, and bronze electric light fixtures. The Lieutenant-Governor's room to the east of the rotunda, is a very elegant square room, finished in walnut with ebony inlay. The walls are panelled to the ceiling, and there are wooden columns in the corners and some carved enrichment. It has a blue carpet and hangings and a French gilt candle chandelier.

EAST ELEVATION.

The reception room and museum is a large and high gallery on the main front of the building, with vaulted ceiling, in the Greek Ionic Order. It has Tennessee marble floor, tesselated with verde antique squares. The lighting tripods placed in niches are of bright bronze, and the walls are tinted in simple quiet tones, and are eminently a place for mural painting.

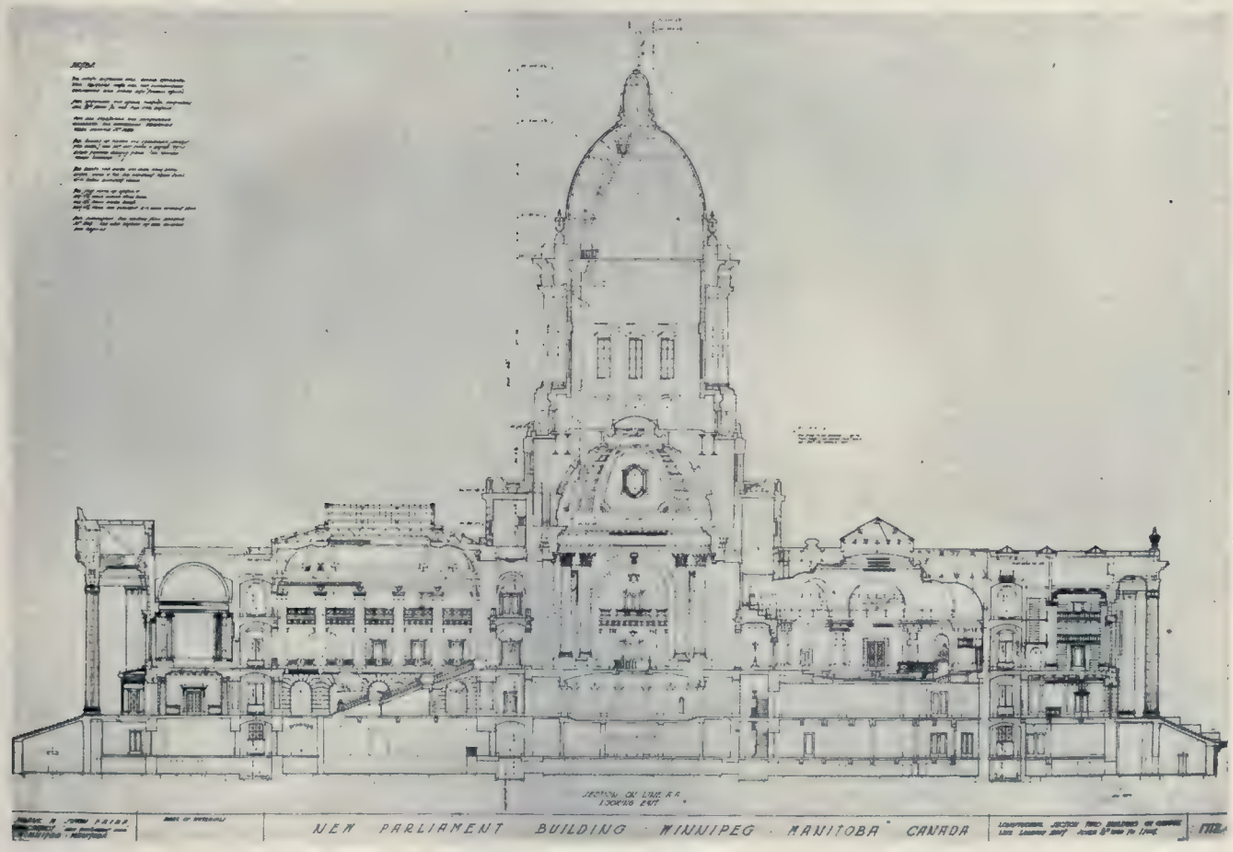
Adoining this room is the executive council chamber, 24 feet by 32 feet. In the centre is a large walnut table surrounded by chairs upholstered in dull blue leather, and lighted by a large saucer-shaped chandelier in dull brass. This room has a quiet elegance without affectation or elaboration. The same may be said of the Premier's offices. Each of the departments has a suite, comprising offices, ante-rooms and stenagraphers' offices for the minister and deputy, connected together by a private hall.

The Provincial library occupies the middle of the south side. It is a room two storeys high with three tiers of steel book stacks for 25,000 volumes. The ceiling is coffered and decorated in Pompeian colors—blue, red, brown and green—the chairs are in crimson leather, while the faces of the galleries and the stack ends are in dull gold. Suspended from the ceiling are chandeliers in dull bronze with clusters of lights at the different levels. Access to the upper tiers is provided by an automatic elevator and two circular stairs. Cataloging rooms and large stack rooms for books and magazines, with space in all for 66,000 volumes, complete the equipment.

MURAL WORK.

The mural work in the legislative chamber represents the work of Augustus Vincent Tack of New York, and is admirably executed. The decoration first of all is a color scheme in blue and gold, the blue carpet and the colors of the architectural features harmonizing with the colors in the paintings. The method of producing the color effects is notable. It may be called vibrant color in which patches, large and small, of strong colors, are put side by side to produce their full effect only in the eye of the beholder. There are delicate gradations and adjustments to the position and the lighting to which the artist has given skillful attention. It is a fine example of the most modern method of mural painting in which simplicity of expression and harmony of figure with backgrounds and an impression rather than the telling of a story are the features. In other words, it is the decoration of a room and

VIEW FROM SOUTH.



SECTIONAL ELEVATION.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG, MAN.

FRANK W. SIMON, F.R.I.B.A., ARCHITECT.

ANTE HALL, LOOKING NORTH.

Copyright Photo, Courtesy Travers Sweatman, K.C.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG, MAN.

FRANK W. SIMON, F.R.I.B.A., ARCHITECT.

not a series of pictures attached to the wall.

In the apse behind and above the throne are the figures of Justice attended by Knowledge and Reason. It is not the "old-fashioned" Justice, blindfolded and with a sword in hand, but a beneficent Justice, open-eyed, blessing the world. On either side of this triad are figures symbolic of Humanity—young and old—rich and poor—strong and weak.

As a background there is the tree of life, symbolic of generation after generation of mankind recalling that passage in the Apocalypse of St. John: "On either side is the tree of life, and the fruit of the tree is twelve and its leaves are the healing of the nations." Two heroic figures on either side of the apse appear as a memorial to the youth of Canada who gave their lives in the great war. On the pendentives between the great gallery niches, are figures of the greater virtues—Mercy and Understanding; Faith, Hope and Charity; Prudence, Fortitude and Temperance; and Magnanimity and Tolerance. Each has its appropriate expression and relation to its fellow or fellows, indicated by attitude and treatment in the most subtle way. The skill of the artist in conveying his message can be recognized only by a careful study of the figures themselves. The seven panels of the ceiling are indicative of the origins of legislation, and the codes of the nations.

The archway in the rotunda over the doorway to the legislative chamber is to be filled with a canvas by Frank Brangwyn, the greatest English mural painter—a master of strong color and light and shade and of heroic action. It is to symbolize the part Canadian soldiers played in the war. As a mural painting it will offer a striking contrast to Mr. Tack's work in that, without overpassing the bounds of proper wall decoration and being still an allegory of war, it represents fruits of real men in the common actions of war—trench digging, the cheerfulness of the Tommy under hardships, as suggested by the man playing the accordeon, the tragic side portrayed in the group of wounded moving up to the dressing station, and the common life depicted in the rationing scene. In the background dominating the composition is a great siege gun being loaded by its crew. Thus will various phases of activities of war be shown and the necessary adjuncts of work in Canada suggested, by which the front was maintained and victory achieved.

Copyright Photo, Courtesy Travers Sweatman, K.C.
BRONZE BISON AT FOOT OF MAIN STAIRS.

SCULPTURE WORK.

The sculpture embellishment is even more fully carried out than the mural. It consists of three kinds: (1) The ornamental details such as capitals, keystones, brackets and the like, which are features of the structure itself; (2) the figures and groups like the caryatide supporting the upper entablature of the staircase

NORTH ENTRANCE HALL.

hall and the pediment group which are framed in by the structure and are designed to exactly fit their place and carry out the architectural scheme, and (3) the separate figures or groups on the pedestals. The first-mentioned are properly architectural ornament, the second and third are sculpture, differing only in the closeness of their relation to their setting.

The pediment group which was modelled by the late Albert Hodge, of London, attracts attention first by its conspicuous situation as well as by its artistic quality. In judging such a group it must be borne in mind that the height above the eye, its peculiar confining frame and the necessities of its composition make it one of the most difficult of sculptural problems. Mr. Hodge, however, has most successfully developed his subject, filling the outer acute angles of the pediment as well as the high apex, the composition being balanced on either side and culminating at the centre. The female figure of Manitoba sits full front in the middle, and to the left there are three distinct groups, connected and related to the central figure by sentiment and gesture. In the corner Enterprise beckons the workers to the Land of Promise. Next there is a finely modelled bull led by Europa typifying the emigration from Europe, and between this group and Manitoba, there are father, mother and child—the new family in the new world. On the opposite side in the angle are two figures clasping a jar whence issues a stream of water fertilizing the earth—the confluence of the Red and the Assiniboine rivers. Next is a group of ploughman and horses, tilling the soil, balancing the Bull-and-Europa group. Between these and Manitoba is a group of a man and a woman bringing the fruits of the soil, balancing the family group. Thus are expression and balance complete, scale maintained, and the space well filled.

Mr. Hodge's work is also seen in the two sphinxes, representing Wisdom and Knowledge, placed on either side of the main pediment, and in the group of two figures, personifying, respectively, Peace and War, above the east and west pediments.

The four large groups at the base of the dome typifying, respectively, Agriculture, Labor, Science and Art, were modelled by Birnie Rhind, R. S. A., a Scottish sculptor, and are splendidly executed. The heroic-seated figures which flank the east and west entrances were modelled by Piccirilli Brothers, of New

Copyright Photo, Courtesy Travers Sweatman, K.C.

LIEUTENANT-GOVERNOR'S ROOM.

York. Those on the east represent the Sieur de Verandrye, the first white man who saw the banks of the Red and Assinoboine, nearly two hundred years ago, and Lord Selkirk, who brought his settlers to this spot in 1812. Those on the west are of General Wolfe and the Marquis of Dufferin.

There are also several figures in bronze, all modelled by Mons. Charles Gaudet, one of the foremost of French sculptors, and they stand out as of superior merit. These are the figures of Moses and Solon in the legislative chamber, and the two great bisons at the start of the staircase and the graceful running youth crowning the dome.

In a word, those in charge of the building have wisely brought together the very highest skill in order that the structure would in no way suffer in its completed aspect.

THE FURNITURE AND LIGHTING FIXTURES.

The furniture and furnishings are also worthy of note, being simple and substantial, and harmonizing with the character of the building, and the finish of each room. This is generally birch in the basement, oak in the main floor, and walnut in the second. In some of the more elaborately finished rooms, inlays and some carvings are used in the furniture, but most of it is severe rather than ornate, and built to outlast several generations and many governments. The carpets and hangings are carried out in the same spirit.

The lighting fixtures are of a very interesting character. In style, Greek, they perpetuate the tripod and the attenuated Pompeian standard form where they stand on the floor, and several pleasing chandelier and bracket forms, for the walls and ceilings. Of bronze or bronze plate, or iron, and with globes or bowls or candle bulbs, they are used within and without with excellent effect, and they add a touch of elegance and color by day as well as by night. The night illumination of the dome is accomplished by great projectors at the four corners of the building. Another note of color is given by the bronze work of the outside doors and vestibule and the elevator and radiator screens.

It is impossible to describe all details of the equipment, of metal casement windows throughout, finishing hardware, electric elevators, the heating system with thermostatic control, the ventilating system by which fresh washed and tempered air is supplied to every room, the

Copyright Photo, Courtesy Travers Sweatman, K.C.

VIEW FROM NORTH ENTRANCE HALL INTO MAIN STAIRCASE HALL.

pneumatic clocks, the vacuum cleaning system, the drinking water and high pressure fire service, and the steel vaults and metal bookcases.

Suffice it to say that nothing which might contribute to the completeness of the building has been omitted. The province has for its use and its citizens have for enjoyment and inspiration an architectural monument which will always hold its own with the best, in its artistic design and planning, in comprehensive treatment and the fine execution of all its details. In the design we see the hand of a competent man who visualized a grand conception and coordinated all the large forms and all the multiplicity of detail to actualize it. In its treatment there is evident the co-operation between architecture and the arts, which have always been hand-maidens, painting, sculpture, metal and marble work, stone and wood carving and many others by means of which a bare, colorless structure is clothed with warmth and interest and the glow of life. In execution it is a signal example of the artist and craftsman and the artisan working together, each at his own specialty and with his own proper materials, but all under the eye of the chief designer, to produce the total result.

The completeness of the scheme will be more fully realized when the setting is fully developed. A park-like plot is to be made of the 30-acre site in which the large, double sweep of drive, leading to the main portico is the largest feature. Other drives give access to the other entrances and these drives form part of an ample system of tree lighted avenues through the property with space for park treatment. These enclose large lawns with spaces for statues, monuments and large vases, while hedges and flower borders, slopes, terraces and sunken gardens will complete the scheme.

The scheme also calls for the diversion of Assiniboine Avenue, which will curve to the north, between Kennedy and Osborne, and pass midway between its present line and the south portico of the Parliament Buildings, bringing it on to Osborne Bridge from the north, and on the level, eliminating the present awkward approach. It should, in the writer's judgment, also have a curve into Osborne Street towards the north for the convenience of traffic. A large space of lawn will thus be left between the avenue and the river bank, the only structure which will stand here being the war monument. which is designed to take the form of an obelisk. This is about the only strip on the north side of the Assiniboine which belongs to the public and it would indeed be a matter of regret if the opportunity offered to improve this space for those who enjoy the river bank should be neglected.

Mechanical Equipment

S. S. Kennedy, Consulting Engineer, Winnipeg.

THE steam supply for heating the Manitoba Parliament Buildings is obtained from a central power-house having five 250 H.P. water-tube boilers, automatic chain grate stokers, induced draft equipment and economizer coils, which is part of a forced circulation hot water system for heating the Law Courts building, all of which was supplied by Messrs. Babcock & Wilcox, Ltd. The fuel is delivered into an overhead steel bunker by means of a bucket conveyor, which also delivers the ashes to an overhead ash dump over the driveway.

A 6′ 9″ x 6′ 0″ reinforced concrete tunnel connects the central power-house with the Parliament Building (a distance of about 1,100 feet) with branch tunnels to Law Courts and Land Titles buildings, and also to the group of University buildings.

An 8″ pipe, carrying steam at 100 pounds pressure, is run through a tunnel to the Parliament Building, and there reduced to 4 pounds pressure for fan coil service and to atmospheric pressure for direct heating.

Except for entrance vestibules and main stairhall, the building is heated by direct radiators placed under the windows, connected to steam supply and vacuum return on a two pipe system. The steam supply to radiators is controlled and operated by valves and thermostats. The condensation from the radiators is discharged into the vacuum return by syphon traps. The condensation is all measured by American district steam condensation meters. The vacuum return piping is run through tunnel to vacuum pump in power house, and is discharged through receiver tank and boiler feed pump to boilers.

A 30,000 C. F. M. fan and steam coils are placed in the basement for heating entrance vestibules and main stair hall. The suction of this fan is connected to re-circulation registers, in the main stair and central halls, also to the main pipe tunnel from power house and to a fresh air shaft at roof level. During the heating season this fan is operated to pull sufficient air through the tunnel to utilize the heat radiated from the 8″ high pressure steam line, which, except in the most severe weather, is sufficient to properly heat the vestibule and main stair hall.

Approximately 35,000 sq. ft. of direct radiation is installed in the building.

VENTILATION

For ventilating the building six fans are used. Fans No. 1 and 2, each having a capacity of 45,000 cubic feet of air per minute, supply fresh air to all offices, committee, library, reading and writing rooms, etc.

Copyright Photo, Courtesy Travers Sweatman, K.C.
EAST SIDE MAIN STAIRCASE HALL.

PERSPECTIVE: LEGISLATURE CHAMBERS.

The fresh air for these fans is taken in through louvre opening at the ground level, and after being heated and washed, is discharged into large plenum tunnels in sub-basement, and from which galvanized iron flues are run to rooms above and delivered into the rooms through lock shield type registers 8′ 0″ above floor. Vent grilles are located just above base board and connected by galvanized iron flues to attic space and allowed to escape through 42″ copper ventilators.

Fan No. 3, having a capacity of 16,000 cubic feet per minute, supplies fresh air to the legislative chamber. The air for this fan is taken in at the roof level, heated and washed, is delivered into the chamber through registers located behind the seats in both the main floor and gallery. Vent grilles are placed at the front of the chamber, and also around the skylight, and connected to ventilators on roof.

Fan No. 4 is for heating and ventilating entrance vestibules and main stair hall, as described under "Heating."

Fan No. 5, having a capacity of 20,000 cubic feet per minute, is located in the dome, and exhausts foul air from all toilet and locker rooms.

Fan No. 6 is a kitchen fan, and has a capacity of 7,000 cubic feet per minute.

The fan coils are all of the regular Vento section, all set on the inlet side of the fans, and contain a total of 12,145 sq. ft. The steam supply to the coils are operated by temperature regulation valves and thermostats, which control the air entering the offices at any desired temperature between 60 and 80 degrees. The return connections to the coils are provided with float type traps.

The fresh air is all washed and humified by mist nozzle type air washer. During the summer time these washers have a cooling effect on the incoming air of 10 to 18 degrees F.

The fan coil casings and outer washer casings as well as the fresh air intakes, are constructed of asbestos lumber ½″ thick, supported and bolted to 2″ x 2½″ x ⅜″ tee iron frame.

The fans are all direct connected to 220 volt, D.C. variable speed motors.

VACUUM CLEANING

Two vacuum cleaning machines are installed in basement, each having capacity for operating four cleaning tools, while maintaining a vacuum of 9 inches. Vacuum cleaning piping, with outlets, is distributed throughout the building so that any point may be cleaned by attaching a 50′ 0″ hose to the nearest outlet. These vacuum

VIEW FROM NORTHWEST.

cleaning machines are the reciprocating high vacuum type, with dry and wet separators.

WATER SUPPLY

The water supply is obtained from the city mains on Broadway. A 6″ line is run into the power house, and from there is boosted by two centrifugal pumps through tunnel to two 10,000 gallon steel storage tanks in the dome of parliament building. From these tanks piping is installed to supply all requirements by gravity.

An underwriters' fire pump is installed in the power house, from which piping with 100 lb. water pressure is run to the group of parliament buildings adjacent, and to 40 fire hose stations in the parliament building.

The domestic hot water is obtained from a hot water heating tank in power house and from four Patterson Booster heaters in Parliament building. The circulation is effected by two small centrifugal pumps, installed on the circulation line in the power house.

For cooling water for drinking purposes, and for cooling kitchen refrigerator rooms, a 4½ ton direct expansion refrigerator plant is installed in the basement. The drinking water system consists of a cork insulated copper tank, with 100 lineal feet of ammonia cooling coil in basement, two centrifugal pumps, an open copper tank in the dome, and circulation piping connection to 16 pedestal fountains in the corridors and 40 fountains and drinking faucets located in the office suites. The supply is all downward to the fountains, and a continuous circulation is obtained by connecting the supply risers back into the cooling tank. On these return connections are lock shield valves, adusted to permit a uniform circulation throughout the system. The operation of the pumps is automatically controlled by float switches at the tank in the dome.

Brass piping and fittings are used for hot water and drinking water and galvanized mild steel pipe for cold water.

The air washer pumps and drinking water pump are of the horizontal split casing valute type, and are direct connected to 220 volt D.C. motors.

INSULATION

The fresh air intakes, between outside walls and the first bank of heating coils, are insulated with two layers of 1″ cork board. Steam piping is covered with 85 per cent. magnesia, 2″ thick on the high pressure side and 1″ thick on the low pressure. Air cell covering is on hot water piping, and wool felt is on cold water piping. The drinking water piping is insulated with cork, 2″ thick.

The mechanical equipment was designed and supervised by the writer.

Economics of Town Planning

Address to Ontario Provincial Town Planning Conference.

By Noulan Cauchon, A.M.E.I.C., M.T.P.I.C., M.A.C.P.I.

THE economics of town planning are the economics of efficiency—of human efficiency. Economics are usually understood to mean the attainment of relative efficiency at minimum energy (eort or cost) on the part of the interested party. Ultimate economics mean the attainment of maximum efficiency by the community, through the disposal of its energy.

Copyright Photo, Courtesy Travers Sweatman, K.C.

LIBRARY.

The eighteenth century industrial revival of England sponsored the theory of economics as the science of wealth—and of labor as a commodity—and was thus accepted by the world. This working theory of relative efficiency, of economics as a force free from ethical restraints produced the slums with their physical and moral degeneration.

The enlightened opinion of England is to-day, by reason of sociological research, seeking to redeem, as a matter of moral obligation and of physical regeneration of its man power—ecenomics as the science of the maintenance of life, and of its enhancement to the fullness of realization.

Ethics and economics are but different yet indivisible manifestations of this first law of nature — the maintenance of life.

Ethics in the broad field of town planning may be taken as those customs of righteousness which have become so, of necessity for survival, in the evolution of the race, and we must will their progressive continuity or be engulfed in social regression.

Ruskin said, "There is no wealth but life," which, short of all quibbling about definitions, may be popularly accepted as the axiom that the maintenance and enhancement of human life is the goal of existence.

The roots of town planning are deep in the biological origin and the evolution of life. We are dealing with the properties of matter and the nature of things—and with the results that flow from action, reaction and inter-action in the economy of human life. There is no such phenomena as the ultimate survival of purely self-sufficient materialism.

My formula for town planning is ethics as indivisible attributes and manifestations of sound organic conditions.

Over 50 per cent. of the population of the United States and of Canada have become ur-

ban dwellers, a trend that bids fair to accelerate towards the comfort, advantages and amenities of community life.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG.

DETAIL OF MAIN PEDIMENT.
FRANK SIMON, F. R. I. B. A., ARCHITECT.

Rural "satisfaction„ short of logical depopulation and extinction must be fulfilled by extending these advantages of co-operation to the agricultural areas. When the economics of sustenance become over-balanced by the profits of materialism, the sociological rate of human exchange goes up till it stifles progress—even life—by physical and moral disintegration.

Economics are but the laws of nature translated into current terms, usually into dollars and cents—as a decimal scale—which, notwithstanding the unstable equivalents in purchasing power of our monetary token, remains the most convenient common denominator to which things by nature can be brought to equation and solution — for the conservation of energy.

APPLICATION OF PRINCIPLES

Irrigation increases production—markedly so where accompanied by intensive cultivation. With fruit trees and small fruit and market gardening an increase of $100 an acre is not abnormal. Five hundred acres at that rate means $50,000 increase—about 5 per cent. on a million dollars—representing an increased capitalized value based on earning power.

The Grand River waters can be diverted towards Toronto and towards Hamilton and the Niagara Peninsula to irrigate about two thousand square miles, the most productive soil and advantageous climate in Canada. The Rideau River project can cover as much east of Ottawa for cereals and fodders.

The cubic foot of water per second that secures a yearly horse power over a ten-foot fall, would irrigate five hundred acres of land in these areas at a cost of about $5 per acre per annum. It is evident that the most valuable use for water, where psosible, is in utilizing its inherent virtues for quickening fertilization.

GRAND RECEPTION ROOM.

Rural planning suggests more intensive cultivation insured by irrigation and the maintenance of a denser agricultural population. This, in tunr, affords the amenities of life, abating the disabilities of isolation and relieving the congestion of cities.

Increasing the users of existing communications and of the equipment of civilization reduces to such extent the cost of production per capita—a national asset in world competition.

The railways and the

highways intersect; the vested interests of corporations and of communities sometimes conflict; wants are many, ideas are fertile, but money, these times, is put through the sieve of penury. Progress may, of necessity, for the moment, be sluggish, but plans for the development of this growing country should be comprehensive in scope and pressed with reasoned enthusiasm.

There are about 26,000 level crossings in Canada, of which about seven thousand are in Ontario.

There are about 5,300 locomotives in Canada, of which about 2,000 are in Ontario, representing about 600,000 horse power for the province. There are about 350,000 motors in Canada, of which about 160,000 are in Ontario, representing 3,200,000 horse power on our provincial roads. About 5 per cent. of railway crossings in the country and 20 per cent. of those in cities are protected.

Engineering architecture, art and contributary efforts are but the technique of sociology. We professionals are but the brotherhood of craftsmen wielding the tools of maintenance.

Determining the occupancy of land and of buildings, the access of light and of air, zoning, housing, and the capacity of transportation is elemental to healthy freedom of growth and of circulation. Deficiency of such mediums culminates in congestion, in economic conscription of life, in commercial cannibalism.

Regional—rural and urban planning—is essentially efficiency engineering on a civic, provincial and national scale—energy in the sociological enhancement of human existence.

Quest of the absolute in efficiency is most fascinating to the scientific mind, but we must beware of all dehumanizing standardization of individuality.

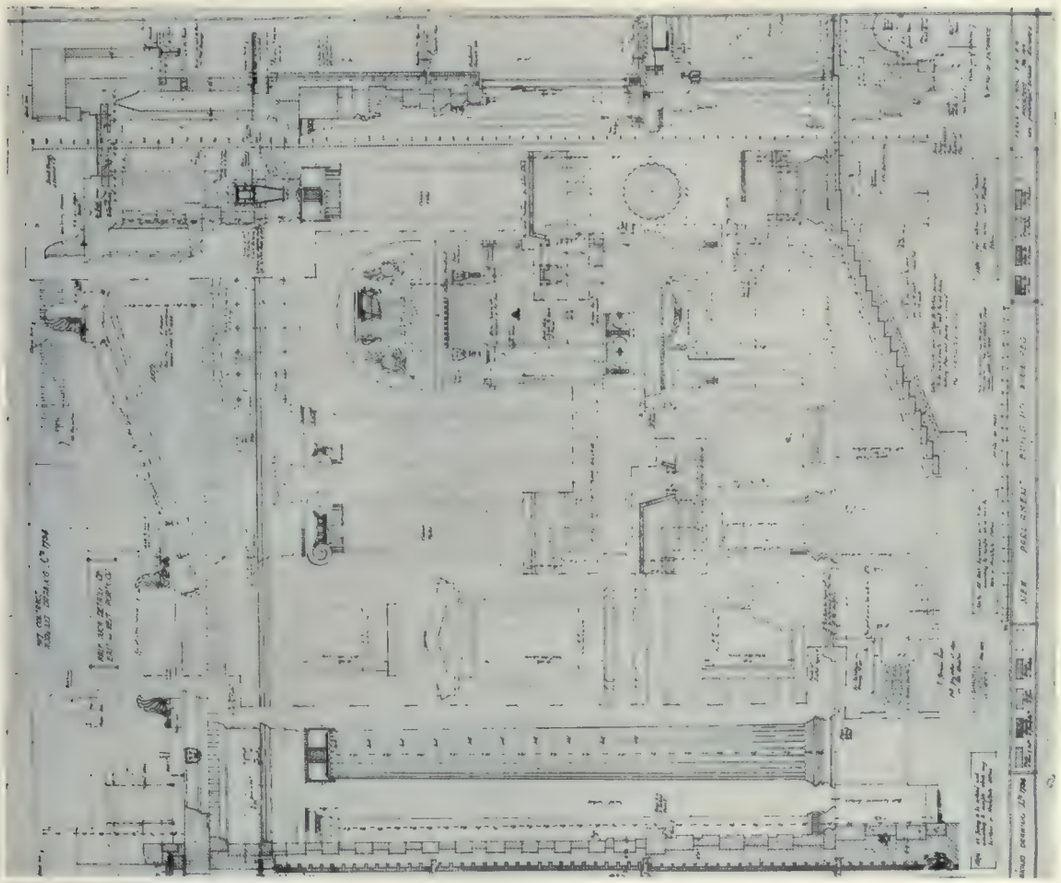
TORONTO

Toronto is to be congratulated on her town planning activities and on her studies for further advances. The great harbor project is reaping industrial progress. The grade separations are advanced and viaduct determined; able studies and reports have been made on transportation problems; the city has had trials in housing and is housing and is facing more. Zoning is being contemplated but that can only be satisfactory if based upon a comprehensive organic plan, coordinating all the activities and possibilities of your great city.

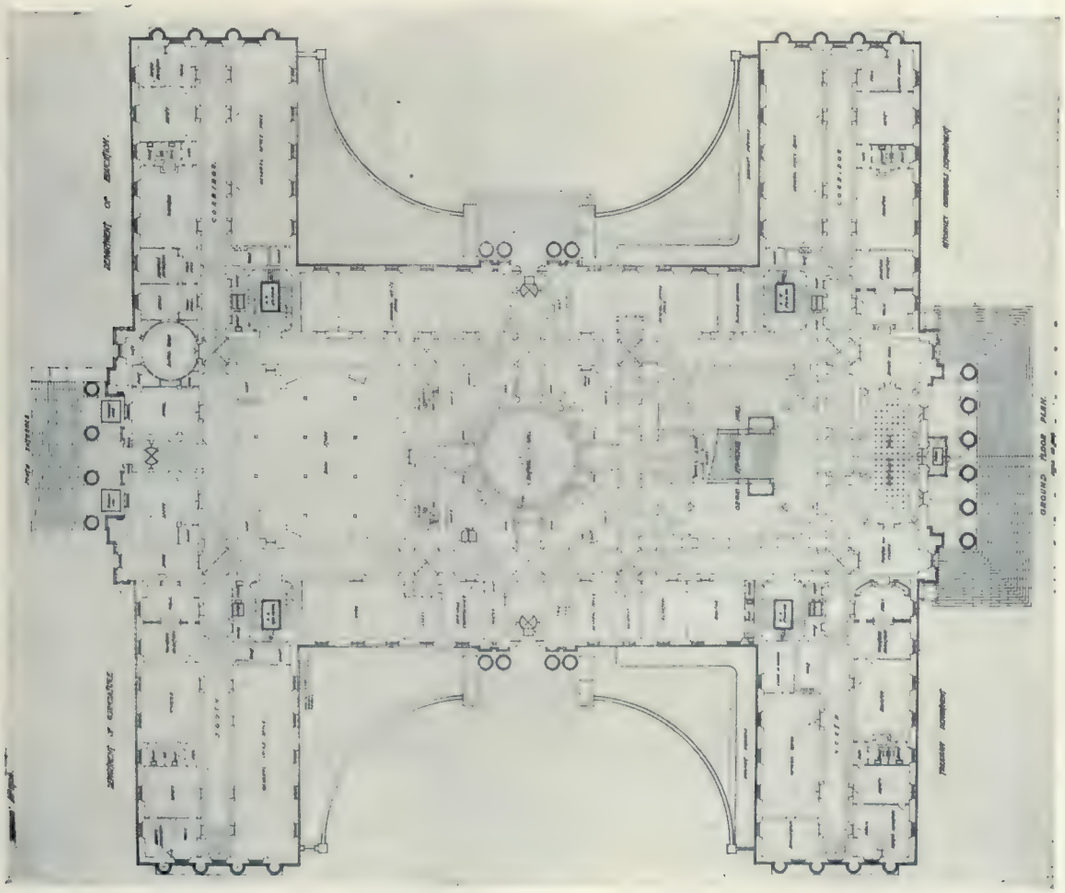
COMMITTEE ROOM.

The vested interests of the city of Toronto as such are probably over $600,000,000, and her citizens cannot begin too soon on the modern theory of scientific management to re-route civic process. Such a step would mean an effective saving in civic expenditures and a better planned and more efficiently administered city in every way.

Capt. J. E. Thompson, member for Northeast Toronto, in the Ontario Legislature, has introduced an amendment to the Municipal Act prohibiting the use of any building for purposes for which it might be structurally unsuited, or which from the size or strength of its walls, supports or floors, might be regarded as improperly constructed and dangerous.

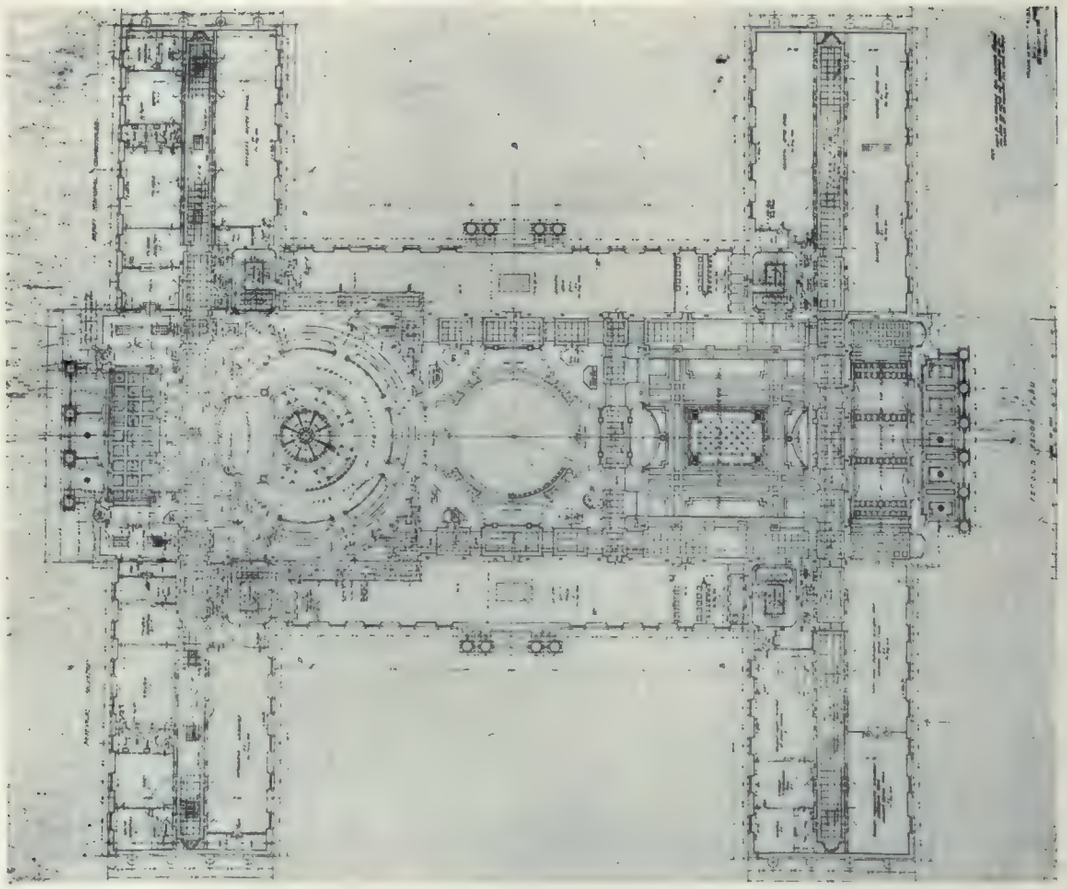


DETAIL OF EAST AND WEST PORTICO.

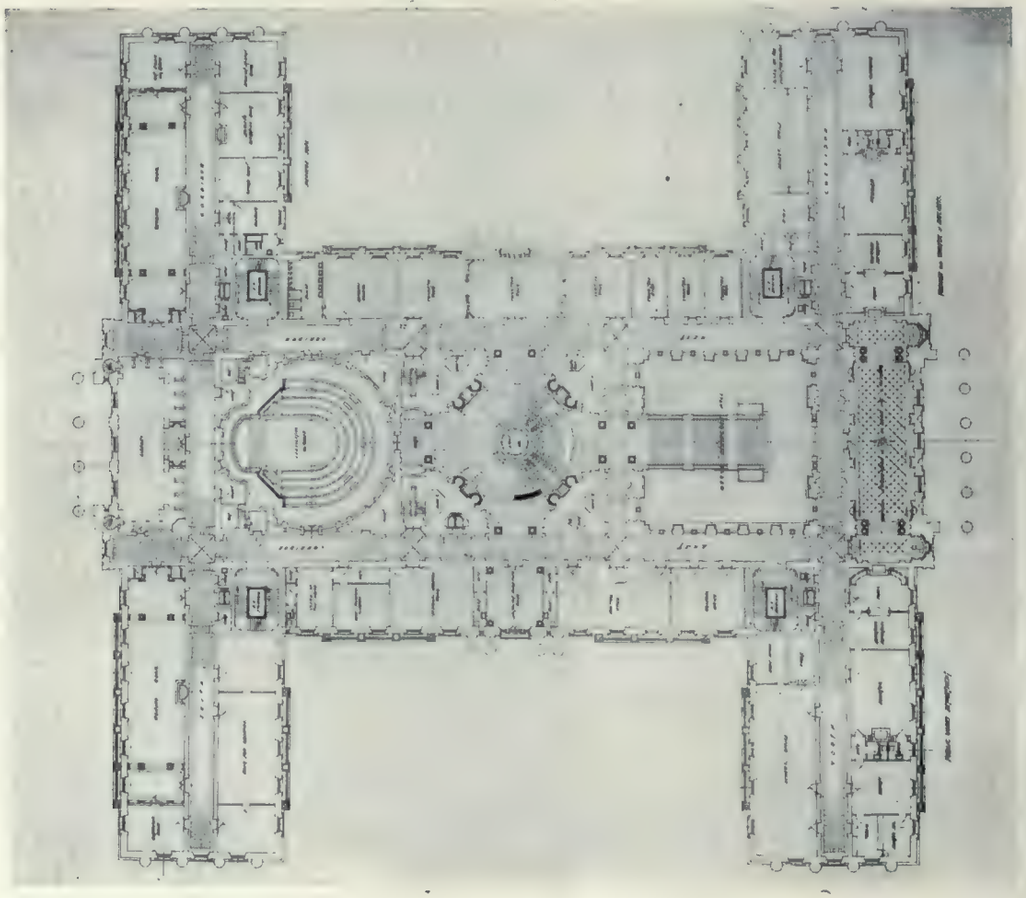


GROUND FLOOR PLAN.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG.



SECOND FLOOR PLAN.

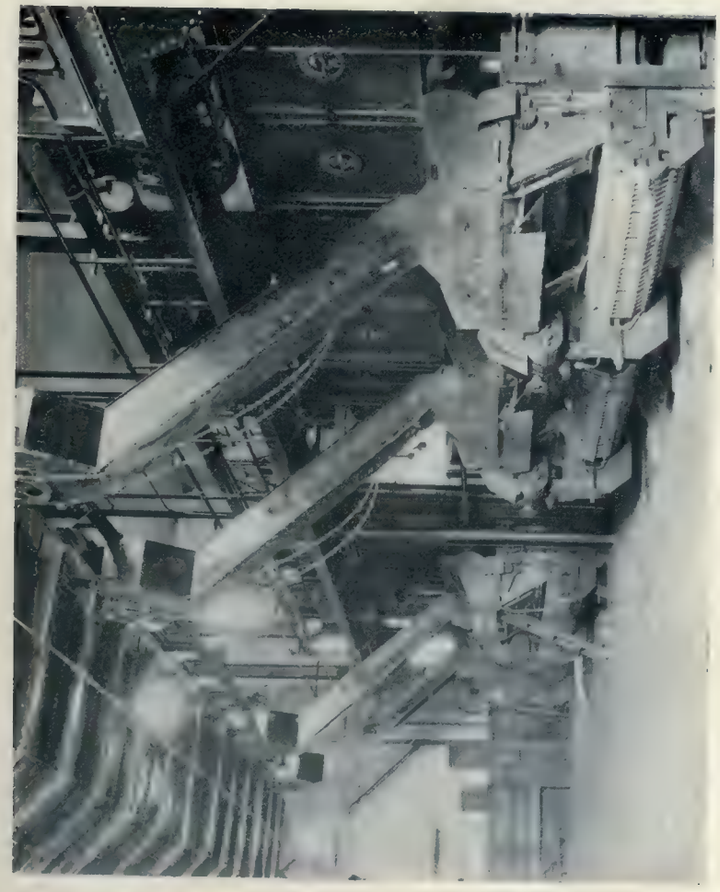


FIRST FLOOR PLAN.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG.
FRANK W. SIMON, F.R.I.B.A., ARCHITECT.

PUMP ROOM, SHOWING FIRE PUMP AND BOILER FEED PUMPS.

UNDERGROUND TUNNEL AND STEAM MAINS.



BOILERS AND MECHANICAL STOKERS.

HOT WATER HEATERS AND DRINKING WATER TANK AND PUMP

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG, MAN.

Why Houses Are Not Built

By Thomas Adams.

WHEN rents are being increased by from 30 to 100 per cent. and people who have paid $55 a month are being asked to pay $100 a month for their apartments; when tenants are being asked to sign long leases at the present high rents; when people have to live in crowded rooming establishments with unsatisfactory sanitary accommodation and pay as high as $40 a month for a room to accommodate two persons, it is quite time that we ask ourselves the question whether we are approaching the stage when there will be no room to live in our cities. What can be the reason for the trouble and where is it going to end?

There seems to be a general impression that the explanation of the shortage of houses is the high cost of building. So long as people convince themselves that this is so and that we are facing a falling market in regard to prices, we will continue to suffer from lack of building and consequent overcrowding. Things in that case will have to be left till they adjust themselves. It will have to be assumed that rentals must reach a point when they will encourage people to pay the high costs of building. But the housing problem will still remain. It was with us before building was dear, and will remain with us unless we have courage to face it as a social and not merely as a financial problem. While builders are not taking the risk of building new houses, they are, by other means, utilizing their time converting old houses into apartments or subdividing houses and apartments until they are forcing families to live in smaller and smaller accommodation. Indeed for the family of the comparatively poor people, we are approaching the stage of being satisfied with the accommodation of the overcrowded German cities, with a large percentage of single-room accommodation.

There would really be no difficulty in solving the problem if we were willing to get rid of the chief causes. It would be absurd to deny that the high cost of building has something to do with present conditions, but the increase in the cost of building in Canada has not been proportionate with the increase in the cost of other things. The cost of building has little more than doubled in Canada whereas it has increased from four to five times in England. Meanwhile rents in Canada have increased proportionately with cost of building so that the latter should not prevent builders from providing houses I think it is true to say that most people would be prepared to buy or rent houses if they could get the accommodation they need, with proper surroundings, even at the present prices of labor and with a reasonable profit to the builder. The trouble is that the kind of houses that are wanted are hardly obtainable. At present prices, houses can be built at from $4,000 to $10,000 and there would be an unlimited demand for such houses, if they were of the right kind and in the right place and protected with the right kind of restrictions.

There are theorists, however, who base their predictions of what the people can afford to pay for houses on what they have afforded in the past when wages were smaller and they are afraid to embark on housing schemes for fear prices will fall so rapidly as to destroy the investment. Yet it hardly seems necessary to make the statement that there will be no considerable fall in prices for building for a few years. The very fact that people are holding back and not building means that when their patience is exhausted in waiting for a fall in prices, there will be a rush of building and, therefore, a revived increase of costs. The fact that costs of building have not gone up so much relatively to cost of food and clothing means that the fall in prices will not affect building to the same extent as other things that are comparatively dearer. Considering then first, the unlikelihood of any great fall in prices of building; second, the fact that we are now many thousands of houses short of the needs; third, that so many families are crowding into apartments as a temporary measure with the hope that they will be able to get a house when building is resumed, and fourth, the fact that all this housing shortage does not take account of the needs that will arise with increasing immigration, why is it that so little building is being done? By converting existing dwellings into apartment houses investors are making good profits, but this means that they could also make good profits by building the right kind of houses, which would benefit nearly as much from the present shortage as apartment houses.

HIGH COST OF BUILDING NOT MAIN CAUSE OF SHORTAGE.

On the face of the facts, therefore, it appears that the high cost of building is not the main factor in causing the present shortage of dwellings.

As in so many other cases our trouble is in accepting half truths as whole truths in considering these economic problems. While on the surface the high cost of building appears to be a cause of falling off in building operations, it

is merely a contributory of the main cause which is the depreciation that has taken place in the security of real estate as an investment. Capital has been driven away from building and real estate and now we want to get it back. Capital, however, is a timid thing and once it has been frightened from one channel and driven into another, it is not easily diverted back again. If further proof is needed that this is the trouble those who like to enquire can find out that there has been a gradual depreciation of security for investment of money in building for many years past and not merely since prices increased. Moreover the shortage of houses existed before the war, and the war merely accentuated the condition, due to the lack of stability provided by our present conditions for the investment of money in land and buildings. We have, therefore, to get rid of theories based on half truths and temporary effects, if we are going to get more buildings and more rapid development of real estate.

HOW TO ATTRACT CAPITAL TO BUILDING.

To know how to attract capital back again we must realize some of the causes which have driven it away. A fundamental cause has been that real estate values have grown beyond the revenue producing capacity of land for the purposes for which it can be used. If this is not so why is it that vacant land in Canada does not provide good security for a loan investment whereas land in older countries like England is one of the things that is included as being suitable for investment of trust funds? An unfortunate feature of the situation is that those who own the land do not appear to realize that it is worse to have a condition in which land values are so high that capital is driven out of the real estate market rather than a condition in which they are low enough to attract capital in all forms.

In most of our Canadian cities land values have risen much more rapidly than the increase of population or expenditure on improvements. This is the source of the trouble. Land has no value apart from its use. This is recognized by banks and mortgage companies and because it is not recognized by speculators in real estate we have here a conflict between those who control capital and some of those who control real estate.

The position is made more complex by the fact that assessed values are based on the speculative values and, consequently, those who have appeared to enjoy the ownership of land at high values have found themselves in a fool's paradise. They have had to pay out high taxes and suffer the loss of compound interest on their investment, which has taken away their anticipated gains. Because, however, they have paid the taxes on these excessive values and lost interest on their capital they naturally cannot bring themselves to accept any change in the present conditions. One may sympathize with the losses that have accrued to real estate owners from the present system, but is there any one who can suggest a way out, except that of getting down to a stable condition of real estate values and assessed values whereby the security of capital employed in building will be restored?

WANT OF TOWN PLANNING A CAUSE.

Another cause of our present troubles is due to the lack of protection afforded to the person who invests in building in regard to the control of the surroundings. If a man erects a home he does not know how soon its value will be depreciated as a result of the way in which the land adjacent to his home is developed. Houses, factories, stores and other kinds of building development are mixed up in such a way as to mutually destroy the value of each class of building. I have evidence of cases where mortgage companies have had the value of property depreciated as a result of this haphazard system to such an extent as to destroy not only the equity of the owner but a part of the mortgage value. This means that we need town planning to enable us to stabilize investment in real estate and building. This is being fully recognized in New York and other American cities where town planning and zoning laws have been introduced primarily to protect investment values in property.

The subject is too big and complex to be dealt with in a short article but the point I have endeavored to make is that high cost of building is only an additional and not a fundamental cause of the present shortage of houses. The real difficulty consists in the lack of security provided for capital in building investment and this existed prior to the increase in cost of building. To re-establish that security we must be prepared to adjust our land values and system of taxation so that they will have a relation to the revenue producing values of property. We must also plan our cities so that the person investing his means in building a home can have his investment protected and appreciated rather than depreciated by the method of control of his surroundings. What our large cities need is to expand outward. There is plenty of land available. The expansion, however, must be planned in such a way as to secure healthy conditions and a sounder financial system of real estate development.

The important fact must be realized that one of the causes that formerly operated in encouraging building no longer exists. Many men in

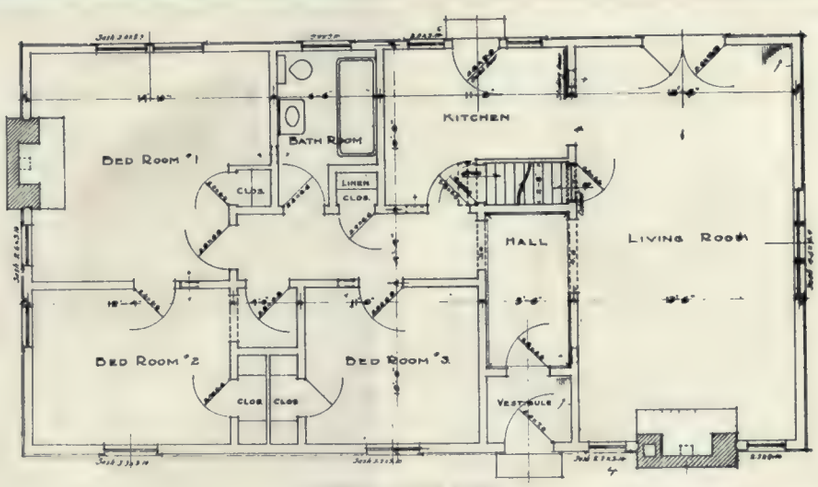
(*Concluded on page 93.*)

DETAIL OF WINDOW.

EXTERIOR DETAIL.

BUNGALOW OF C. P. MEREDITH, ARCHITECT, OTTAWA, ONT.

BUNGALOW OF C. P. MEREDITH, ARCHITECT.



OTTAWA, ONT.

GROUND FLOOR PLAN.

The Meredith Bungalow, Ottawa

Apart from the simplicity and quaintness of its design, special interest is attached to the bungalow illustrated above in that it was erected and occupied in a month's time. It was built by Mr. C. P. Meredith, a well-known architect of Ottawa, for his own use, and is intended for a small family. It will be observed that the plan provides no dining room. Instead, the kitchen and breakfast room is really a kitchen and breakfast room combined, the other meals being served in the living room on a travelling table which can be conveniently removed to the kitchen when not in use. An additional feature is a shallow china cabinet which serves to hide the doorway of the attic stairs. This cabinet swings out, and really becomes the door to the stairs.

The photograph on the opposite page shows the detail of the entrance and chimney-piece and the flag walk, and indicates to some extent the character of the site, which affords a splendid outlook along the Rideau River.

The ground on both sides is terraced and enclosed with a low retaining wall of river stones, with a wooden fence along the front and stone steps leading to the lower level. The walls of the house are built of wall board, to which the exterior stucco is directly keyed; the roof and woodwork are stained brown and the windows of the casement type.

O. A. A. Notes

Regular meetings of the Council of the Ontario Association were held in the association rooms at Toronto on February 18 and March 12, when further consideration was given by the executive to the proposed revisions of the Ontario Architects Act, the members of the legislative committee and the solicitor of the association being instructed to prepare and submit the proposed bill and amendments to the Legislature at the earliest possible date. It was further decided in this connection to urge upon the members of the association the necessity of interviewing members of the Provincial Legislature for their respective constituencies with a view to securing full support for the bill.

Both meetings were fully attended, with President Moore in the chair, and Messrs. Hynes, Kelly, Page, Shepard, Watt, West, Meredith and Wickson of the executive present.

At the first meeting a committee composed of Messrs. Shepard and Page was appointed to consider revisions of the by-laws concerning classes of membership.

The Council also authorized that a cheque for $300 be sent to the treasurer of the Royal Architectural Institute of Canada in advance on account of fees due July next, this representing the per capita tax for members of the association.

A letter was received from the secretary of the American Institute of Architects, to which a reply was drafted by Messrs. Hynes and West, a copy of the above letter and a communication from the Council being sent to the Royal Architectural Institute of Canada and the affiliated provincial bodies.

At the second meeting a committee composed of Messrs. McGiffin and Page was appointed to prepare a Roll of Honor to contain the names of all members who served in any department of the army, navy or air force.

The publicity policy of the association was discussed at length, and the publicity committee was authorized to proceed with the campaign as outlined, including newspaper advertising, pamphlets, etc., at a cost not to exceed $1,000.

A letter from the secretary of the Royal Architectural Institute of Canada was received asking what time of the year would be most convenient to hold a Royal Institute of British Architects examinations, to which a reply will be sent by the secretary suggesting the month of January as a most suitable time.

The Council went strongly on record in favor of the retention of the office of the Town Planning Adviser in connection with some department of the Federal Government, and will take the matter up with the executive of the R.A.I.C., with a view to urging upon the Ottawa authorities the desirability of such a course.

On recommendation of the Board of Admission, the following were admitted to membership: John A. Robertson, Hamilton, Ont.; H. G. Salisbury, Toronto, Ont.; John Evans, Galt, Ont.; H. E. L. Owen, Port Colborne, Ont.; F. C. Bodley, Brantford, Ont.

Toronto Chapter to Hold Architectural Exhibition

The proposed architectural exhibition to be conducted under the auspices of the Toronto Chapter of the Ontario Association of Architects, will be held during the first week in May. This was decided at a luncheon meeting held on March 18, when Messrs. Somerville, Warrington and Shepard were appointed members of the management committee. Space suitable for gallery purposes has been secured in the Murray-Kay store, located on King Street East, near Yonge, in the centre of the down-town shopping district, which will give a splendid opportunity for the public to view the collection of architectural drawings. It is proposed to serve afternoon tea during the exhibition, and if possible to hold a banquet on the opening night.

Bungalow on Factory Roof

A piano factory in Cincinnati has the distinction of possessing a bungalow on the roof of its new factory. A complete bungalow of English design and a beautiful garden, with hedges, walks, flowers and trees has been provided. The entire construction is an architectural novelty for it will not rest on the roof of the factory. Reinforced concrete columns will be brought through the factory roof. The foundation for the garden and bungalow will be built on I-beam supports resting on these columns. The bungalow is to be used as a meeting place for officers and directors of the company; but the plans show a structure of exceptionally homelike possibilities. There is an immense living room, with a big open fireplace. There is a kitchen, an enclosed dining porch, bathrooms with tub and shower baths, and a big stone terrace leading to the garden. There is to be a lawn with a number of walks, several of them beach pebble paths, and one a plank walk "country style." A red tile roof, of sweeping slope, will converge with the tile edge of the factory roof at the south end of the building. The bungalow will face toward the north.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:

MONTREAL—171 St. James Street,
C. S. Soutter, Representative.

WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue.
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, March 1921 No. 3

Delayed Public Buildings

Both the daily and technical press have from time to time urged upon the Government the advisability of proceeding with at least part of its delayed building programme. Quite apart from helping to take up the unemployment slack, it is expedient that this should be done in the interests of economy and efficient administration. A concrete instance which bears out this statement, and which could be multiplied in a number of instances, is found in Toronto where, since the old customs house has been demolished, the customs department has labored under a handicap due to the fact that its various branches are now temporarily housed in several scattered buildings with nothing which resembles a cohesive working plan or proper co-ordination as regards service and administration.

The system or lack of system which exists as a result is both wasteful of time and effort, besides costing the Government a pretty penny annually in the way of large rentals which have recently been subjected to a substantial increase. These rentals collectively represent a huge sum which, if applied to actual building operations, would offset to a large extent existing material and labor costs. As it is, the money thus spent is totally lost, instead of entering into a permanent structure which would provide adequately and properly planned facilities for successfully carrying on public business.

While there were certain circumstances in the period of the war which justified in a measure a delay in proceeding with work of this character, the Government at the present time would be ill-advised to persist in a policy of further postponement. To divert the monies which are now going into rentals would not only be good economy, but in the last analysis would represent a substantial saving of public funds. It is the general opinion that building costs are practically as low as they will be in the next two years, and that instead of deferring work of this character for a longer period, it would be in the best interests of the public to proceed with the most urgently needed buildings, and to carry out in existing structures many badly needed repairs.

Building Employers and Employees to Confer

A recent press despatch states that a conference to consist of thirty representatives of employers and workmen, respectively, engaged in the building and construction industry, has been called by the Minister of Labor for May 3rd, at Ottawa. It will be similar to the national industrial conference held in Ottawa in September, 1919, except that it will be confined to the building and construction industry.

In a brief statement handed out by the Minister of Labor, it is pointed out that, at a recent session of the National Joint Conference Board of the building and construction industry of Canada, which is composed of representatives of both employers and workmen engaged in the industry, a resolution was passed proposing that the Labor Department should call a conference to discuss questions of interest to both employers and employees. The proposal was submitted to the Minister by J. P. Anglin, on behalf of the employers, and Tom Moore, on behalf of the workmen affected, and was approved by the Minister.

Relative Strength of Sheathing and Wall Board

A practical test to determine the relative strength of sheathing and Bishopric Board as applied to construction was recently made by the department of building inspection at Hartford, Conn. A load of 300 lbs. was used, deformation being measured at each loading.

The result of the test on 7/8" M and B sheathing, one side, with wood lath on opposite side, was as follows:

300	deformation	7/32"	1200	deformation	2¾"
600	"	21/32"	1800	"	6 7/16"
900	"	1½"	2100	"	8 5/16"

When load was released deformation showed 5 3/16".

Result of test on Bishopric Board on one side, with wood lath on opposite side using same loading as on sheathing, showed the following deformation:

300	deformation	1/8"	1500	deformation	1¾"
600	"	1/4"	1800	"	1 9/16"
900	"	9/16"	2100	"	2"
1200	"	13/16"	2400	"	2 7/16"
			2700	"	3 1/16"

When load was released deformation showed 1⅝".

In his report to the Bishopric Mfg. Co., Frederick W. Barrett, supervisor of buildings, stated that the test showed very clearly that Bishopric Board properly put on, was much stronger than sheathing, and that there was no reason why same should not be allowed to be used where 7/8 sheathing can be used.

Bungalow on a Roof Top

Plans for a very novel building project have been filed with the Building Commissioner of Cincinnati. They provide for the erection of a complete bungalow of English design and a beautiful garden, with hedges, walks, flowers and trees, on the roof of the new piano factory nearing completion on Gilbert Avenue, opposite Eden Park. The bungalow is to be used as a meeting place for officers and directors of the company; but the plans show a structure of exceptionally homelike possibilities. There is an immense living room, with a big open fireplace. There is a kitchen, an enclosed dining porch, bathrooms, with tub and shower baths, and a big stone terrace leading to the garden. There is to be a lawn with a number of walks, several of them beach pebble paths, and one a plank walk, "country style." A red tile roof, of sweeping slope, will converge with the tile edge of the factory roof at the south end of the building. The bungalow will face toward the north.

Cannot Match Stone in Rheims Cathedral

A new problem has arisen in connection with the restoration of the Rheims Cathedral. The peculiar kind of stone used in the erection of certain portions of the building during the thirteenth century is showing signs of disintegration, probably due to the constant subjection to poison gas and shell fire during the war. It is feared that, for this reason, important sections of the walls may collapse.

It was generally believed that the whole cathedral had been built out of limestone taken from the Rheims Mountain, but it is now learned that the thirteenth century work was all done with a peculiar alluvial rock formation, brought from Fismes, which is known as "Roman block." When polished, this Roman block took on a rose gold surface in which small fossil formations could be detected.

Seven hundred winters, centuries of rainstorms, had left this stone practically undamaged until the German war gas got in its destructive work. Thus far, however, geologists have been unable to find more of this Roman block for the repairs which, if done with ordinary stone, would detract from the beauty of the structure.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in this Issue.

MANITOBA PARLIAMENT BUILDING.

General Contractor, James McDairmid Company.
Roofing, Vulcan Asphalt and Supply Co.
Waterproofing, Vulcan Asphalt and Supply Co.
Modelling and Stone Carving, Piccarilli Brothers.
Stone Carving, F. A. Purdy.
Stone, Tyndall Quarries.
Metal Casement, Henry Hope & Sons Co.
Elevators, Otis-Fensom Elevator Co.
Electrical Fixtures, Edward F. Caldwell Co., Inc., New York.
Electrical Fixtures, Robt. Mitchell Co., Montreal.
Electrical Fixtures, Northern Electrical Co.
Plumbing, Cotter Bros., Winnipeg.
Furniture, J. A. Eshelby, 6 New Burlington, Regent St., London, Eng., Lieut.-Governor's Room.
Carpets (Legislative Chambers), Sloan's, New York City.
Refrigerating Equipment, Canadian Ice Machine Co.
Ornamental Iron Work, Architectural Bronze & Iron Works.
Ornamental Iron Work, Western Supply Mfg. Co.
Metal Book Stacks, Snead Co., Iron Works Ltd.
Steel Vault Equipment, Office Specialty Co.
Steel Vault Equipment, Willson Stationery Co., Ltd.
Steel Vault Equipment, Steel Equipment Co., Pembroke.
Steel Vault Equipment, Dennis Wire & Iron Works Co.
Bronze Castings, Roman Bronze Foundry, Brooklyn, N.Y.
Mural Decorations, Vincent Tack, New York City.
Stone Cutting, Aug. Gillis Stone Co.
Water Tube Boilers, H. P. Babcock & Wilcox.
Temperature Regulators, Johnson Temperature Regulation Co. Toronto.
Heating or Ventilating Equipment, Darling Bros., Montreal.
Condensation Meters, American District Steam Condensation Meters.
Fans, Canadian Sirocco Co., Windsor, Ont.
Vacuum Cleaners, Blaisdell Machinery Co., Bradford, Pa.
Boiler, Patterson Booster Boilers.
Air Washer and Drinking Pumps, Ingersoll Rand Co., Sherbrooke, Que.
Motors, etc., Canadian Westinghouse.

Why Houses Are Not Built

(*Continued from page* 87.)

the past have bought land and built houses with the fairly certain knowledge that the land would appreciate in value, thereby giving them a prospect of gain apart from the cost of the building. If this prospect were still in view there would be adequate stimulus to building homes at the present time, even under conditions as they are. But the man who has to pay 75 cents to $1 a square foot in the suburbs cannot expect to make any money out of the land to counteract the present costs of building, *when he has no security that the land adjacent to his lot will be developed in such a way as to appreciate its value.* On the contrary, he will probably decide that the chances are in favor of depreciation because of the lack of town planning.

It may be difficult to do any positive thing that will secure an adjustment of land values to re-establish credit in real estate investment. It is not, however, difficult to prepare a plan for any city or municipality that will largely have the desired effect and help to remove one of the chief causes for the withdrawal of capital from building and the consequent shortage of houses. To solve the housing problem we must have a larger imagination in city building.

Rivetless Steel Building

Electrically welded steel structures are beginning to become familiar in Great Britain, which was the first country to apply this method of jointing in place of riveting. The latest building to be erected on the system is the new factory of an electric welding company in Scotland. For the most part, the general design of the columns and the roof is on standard lines, but no rivets are used. Simple, straightforward joints are made by arc welding, the electrodes which produce the arc (whose heat affects the weld) being coated with a special conducting flux which itself forms an arc and, in melting, covers the molten steel and prevents it oxidizing. The work is done with great rapidity and saves a material amount of steel.

Oak Roof Lasts 500 Years

The interest which belongs to Westminster Hall is not confined to its historic associations with the beginnings of Parliamentary Government, but extends to its relations to the science and art of architecture.

The roof, as it is seen at the present day, dates from 1397 and illustrates the beautiful

PROPOSED MEMORIAL ARCH AT ROYAL MILITARY COLEGE, KINGSTON.

Winning design for the Memorial to be erected shortly by the Royal Military College Club of Canada and relatives of the fallen to those ex-cadets who fell in the Great War and previous conflicts. The seven architects invited to compete were: Woodman & Cubbidge, Winnipeg; McDougall & Featherstonaugh, Louis Amos and J. O. Marchand, Montreal; K. Baldwin, Jno. M. Lyle and Sproatt & Rolph, Toronto. The winner of the competition was John M. Lyle, a well-known architect. Prof. Traquair, of McGill University acted as assessor. In accordance with the terms of the competition, the different designs have been on exhibition at the Art Gallery of Toronto. The arch is to be erected at the outer entrance to the Royal Military College, and the estimated cost is $60,000.

development of woodwork at a period when Gothic architecture was at its best. It is sad to think that even woodwork will not endure

ROOF TRUSS IN WESTMINSTER HALL, LONDON.

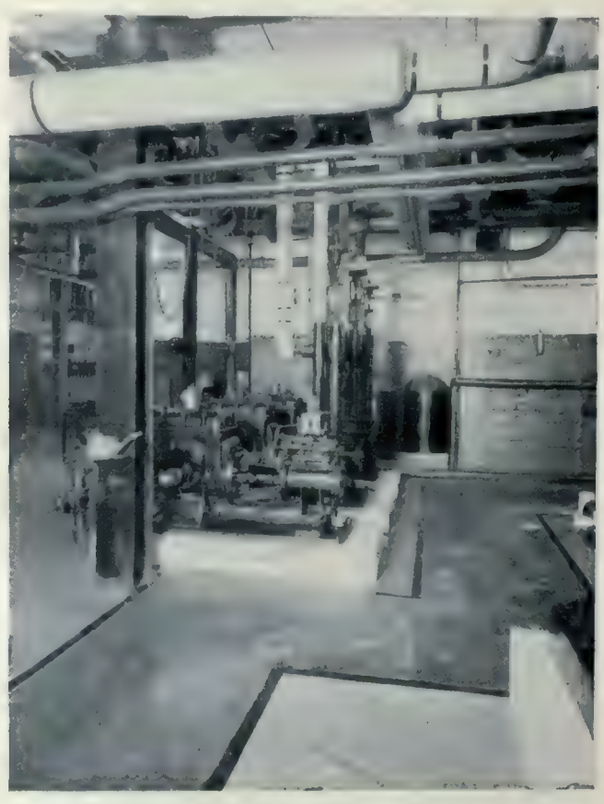
for ever and that it has at last been necessary to restore this beautiful construction. Although considerable renovations were effected in 1823, it was not found necessary to make any extensive repairs to the woodwork until quite recently when it was discovered that much of the structure has been attacked by a wood-boring beetle and rendered unsafe.

The British Government is a jealous guardian of its ancient buildings and has ordered the restoration of the roof to be undertaken in a manner which will offend neither the historian nor the artist, and although every roof-truss will be taken apart and renewed where necessary and will serve only as a mask for a hidden steel structure, there will be no visible evidence of any change.

Those who are interested in seeing the effect of boring insects in these timbers of Westminster Hall may see a piece of the material in the public exhibit of the Forest Products Laboratories of Canada at 700 University Street, Montreal, where a large sample has recently arrived from the Director of Works in London.

There has been in the past some discussion as to the kind of wood of which this roof of Westminster Hall was constructed, some people maintaining that it was oak and others suggesting that it was probably chestnut. The Director of Works has no doubts on the subject himself and the wood experts at the Forest Products Laboratories of Canada are able to confirm his opinion that it is oak.

GENERATOR ROOM IN POWER HOUSE.



VIEW SHOWING VACUUM PUMPS.

NEW MANITOBA PARLIAMENT BUILDING, WINNIPEG, MAN.

Toronto, April, 1921 Vol. XIV., No. 4

CONTENTS

LINDENLEA HOUSING DEVELOPMENT, OTTAWA 97

GOVERNMENT ARCHITECTURAL DEPARTMENTS 104
By W. L. Somerville, Architect.

ETHICS FOR CONTRACTORS 105

SOME RECENT BUILDINGS OF THE MOLSONS BANK 107

ARCHITECTURAL MANAGEMENT 115
By Frank B. Ellis, Architect.

BUILDING MATERIALS AND PRICES 122

EDITORIAL 124

Full Page Illustrations

PLOT PLAN OF LINDENLEA ESTATE, OTTAWA 96

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

LINDENLEA ESTATE.

OTTAWA HOUSING COMMISSION DEVELOPMENT.

PLOT PLAN BY THOMAS ADAMS.

F. E. BELFRY, HOUSING ARCHITECT.

Lindenlea Housing Development, Ottawa

THE original intention of the Ontario Housing Act was to permit a convenient method of building houses for working men and because the majority of cities in the province are industrial centres, the interpretation of the act has been the provision of houses for the workers of industry. Ottawa, however, can hardly be considered a manufacturing centre compared with other cities of the same size, in that as the capital city of the Dominion, the great percentage of the so-called working people are employees of the Government and known as civil servants.

The city has therefore been called upon to provide a class of accommodation that may be regarded as a little better than what is usually known as industrial housing, and which may easily be called a "Garden City Development."

Prior to the appointment of the Local Housing Commission in 1919, the civil servants had organized an association with a large membership to promote a housing scheme. The majority of those interested have made an extensive study of plans and costs and were prepared to back up a large undertaking to provide homes. This gave encouragement to the development of a comprehensive group scheme, and with this object in view the Commission secured the property known as the Lindenlea Estate, comprising 22½ acres. The streets and lots were planned by Mr. Thos. Adams, the Federal Housing and Town Planning Adviser, and the individual lots were offered at a cost in proportion with the entire purchasing price, ranging from four to five hundred dollars for areas of three to four thousand square feet.

One serious difficulty confronted the Commission in securing contracts with the cost of building, seemingly, greater in Ottawa than in other cities. A number of designs were produced according to wishes of buyers but several were abandoned because of the inability to build them within the cost limits of the act, but after lengthy negotiations with the builders limited contracts were undertaken at $4,000 for such brick types as Nos. 6, 15, 23, 29 and 32, and $3,000 for the frame type corresponding to No. 5 or 5A. By the time the buyer added the features desired, the brick type cost in the neighborhood of $4,500 and the frame type ran from $3,150 to $3,400, according to the interior finish or the amount of brick veneering.

With a few exceptions the plans finally adopted may be termed "standard" with living room and dining room in combination, kitchen alongside of dining room, stair on outer wall with

HOUSE (TYPE 1.), ON LOT 6, LINDENLEA ESTATE, OTTAWA

HOUSES ON LOTS 5 & 6, (TYPES 5 & 37), LINDENLEA ESTATE, OTTAWA

hall to kitchen between living room and stair, and three bedrooms and bathroom on the upper floor. Houses of type 5 and 29 are "standard" of minimum sizes. Type 32 is practically the same as 29 but one foot larger each way to permit the fourth room on the bedroom floor and allows a grade entrance to the cellar stair. This type is interesting because of its economy of space. Type 6 is an enlargement of the standard with similar accommodation to No. 32 but with more ample dimensions, particularly in the living room. The originals of type 29 on lot 160 and type 32 on lot 161 are illustrated, as well as No. 6 on lot No. 1.

Types 15 and 23 are the exceptions. They have a centre hall between the living room and dining room, and No. 15 has been used with the broad side to the front with centre entrance, as well as the original intention of the end approach as illustrated. One popular arrangement in this plan is the combination on the main stair, allowing steps from the kitchen. Another feature is the balcony or sleeping porch with doorways from two bedrooms. A very pleasing interior can be made on this plan by leaving down the hall partition at living room and dining room and substituting arches, pedestals or cabinets. Type 23 is a development of No. 15 with an attempt to secure the same accommodation at reduced cost, by including the verandah and upper balcony within the general dimensions. The illustration of these houses on lots 7 and 8 give an idea of the comparison.

HOUSE (TYPE 4), ON LOT 103.

The plan of type 5 was adopted with different exteriors such as all stucco, brick and stucco, all brick veneering, and in some cases siding on lower storey with shingles on the outer walls of upper storey. Lot No. 6 has the original type No. 5, while lot 65 shows the same design in siding and shingles.

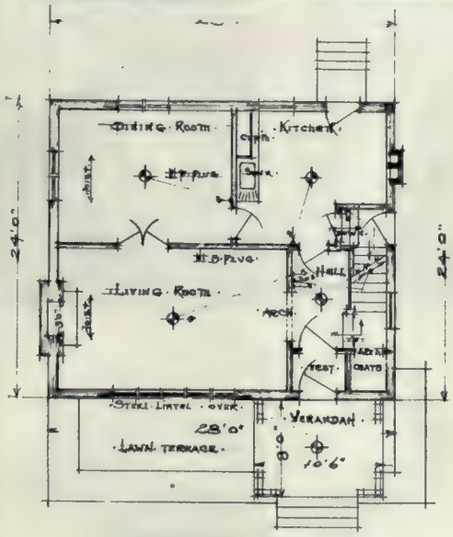
In 1920 prices increased from 20 per cent. to 30 per cent., and the possibility of securing anything out of the ordinary for the prospective buyer was about impossible. Loans on brick veneered houses were increased to $4,000, and the Commission offered limited contracts for the minimum size, standard types, a number of which were taken up quickly, and in order to eliminate the demand for special privileges about 60 houses were erected and completed before placing them on the market. Under this arrangement such types as 29A, 33 and 35 were adopted. The new method enabled

the Commission to erect houses in groups on symmetrical lines in such places as squares, circles or semi-circles as indicated in the estate plan, but such endeavor created the problem of designing a satisfactory variation in exteriors within the limited costs. One group is illustrated on lots 110 to 114, and another on lots Nos. 148 to 152.

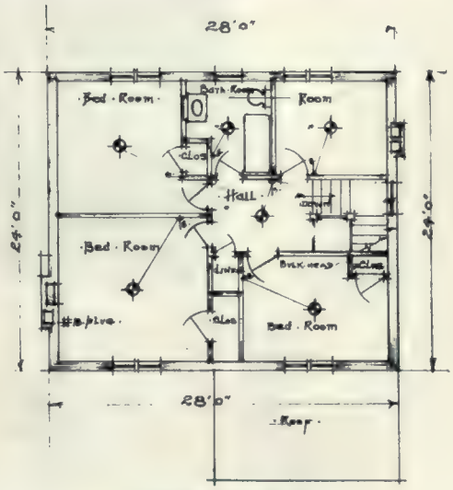
Type 29A is a revision of the gambel roof house of the previous year, but used with such changes to the exterior as stucco in the gable and cutting back the peak of the glables. No. 33 is the same plan but with cottage roof and dormers. No. 35 is a similar plan, but one foot wider and one foot shorter. The roof in this case is pitched to front and back, and in some cases stucco is introduced. These latter types are limited in number, and while provided strictly within the Act with all necessary accommodation such as plumbing and heating, the buyer may add a verandah, hardwood floors, mantel and other features, and in this way purchase a detached house on a fair size lot with 35 or 40 feet frontage and thereby secure the start of what can later be made an attractive home.

Several special plans (not illustrated) were made and used to accommodate persons who introduced their own builder, and while a number were similar to the standard arrangement, yet some are particularly worthy of mention, such as the bungalow known as plan No. 52; a design corresponding to a Swiss chalet, which became plan No. 37; and the home of Mr. David Hunter, a local architect, who supplied his own drawings and built on lot No. 50.

The estate, for the greater part, is thickly wooded and has a slightly rolling surface along the most beautiful driveways. The Lindenlea road is an avenue of tall trees and follows the crest of a bank overlooking the flatter areas. Special credit is due the promoters, and particularly to Mr. Thomas Adam, who planned the ground scheme for the layout of the principal feature, such as space for formal gardens, park areas, bowling green, tennis court, children's playground and wading pool, etc., and the retention of the natural rock, shrubbery and trees



GROUND FLOOR PLAN.



UPPER FLOOR PLAN.

HOUSE (TYPE 6), ON LOT 1.

on Rock avenue, where the roadway divides and passes around what might be termed Rock Island. The main thoroughfare called Rockcliffe Way stretches diagonally across the estate and swings from a straight line to graceful crescents. It is the hope of the residents of the community to have this road beautified and provision has been made to run the wiring poles along the rear of lots and take wires underground at each approach, so that pedestal lights can be erected at the entrances.

In addition to the building of Lindenlea, the

TYPES 29A AND 33, ALTERNATELY ARRANGED ON LOTS 148 TO 152.

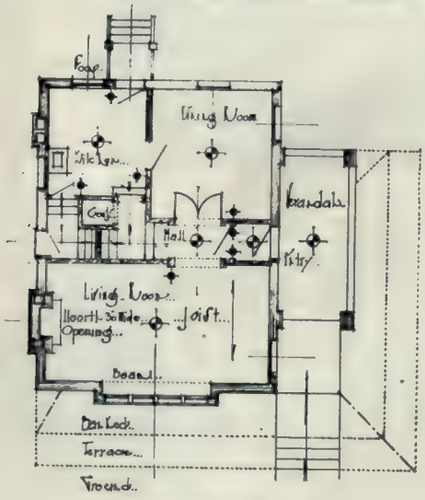
TYPE 23, LOT 7.

BUNGALOW TYPE.

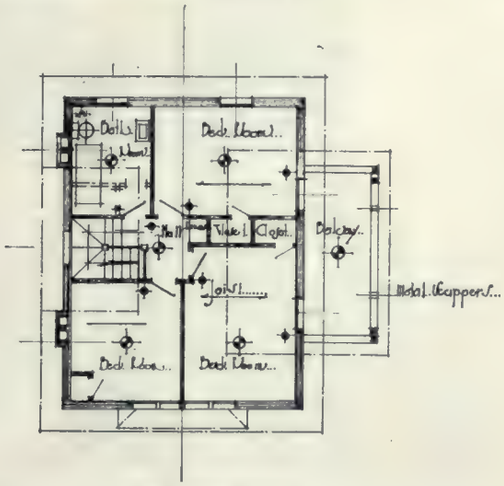
HOUSES ON THE LINDENLEA ESTATE, OTTAWA.

F. E. BELFRY, ARCHITECT.

HOUSES ON LINDENLEA ESTATE, OTTAWA, TYPE 23 (LEFT), TYPE 15 (RIGHT), LOTS 7 & 8.



GROUND FLOOR PLAN.



UPPER FLOOR PLAN.

(ARRANGEMENT OF HOUSE, TYPE 15, ABOVE.)

Housing Commission have granted loans to a number of citizens to build on individual lots throughout the city, and have altogether guided the expenditure of nearly three-quarters of a million dollars.

The members of the Commission are Messrs. J. A. Machado, chairman; Walter Todd, vice-chairman; John Cameron and Colborne T. Meredith, who are to be commended for the progressive and far-sighted policy of their administration. Mr. Franklin E. Belfry, the official architect of the Commission, is responsible for the designs of the houses illustrated.

It is the intention to further the work of development during the coming year, and with this object in view, it is announced that the city of Ottawa will be requested to make a grant of $100,000 to be backed by Federal bonds for the purpose of meeting the still urgent demand for additional accommodations.

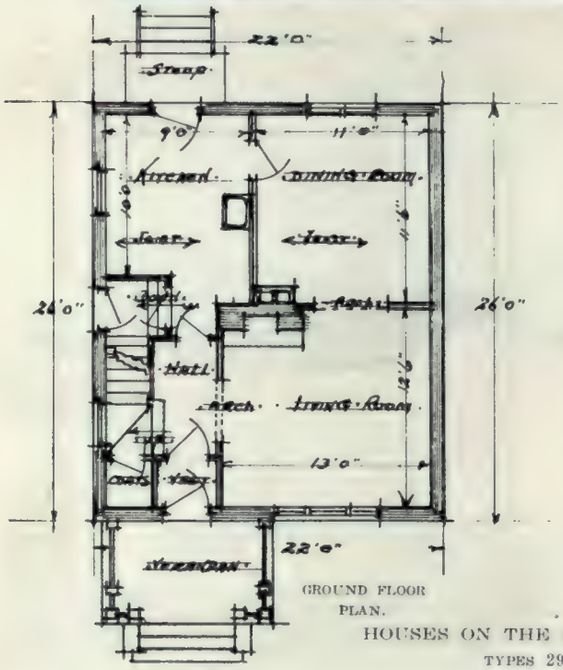
The Estrangement Between Engineers and Architects

That an unfortunate estrangement exists between engineers and architects that is detrimental to the accomplishments of both professions

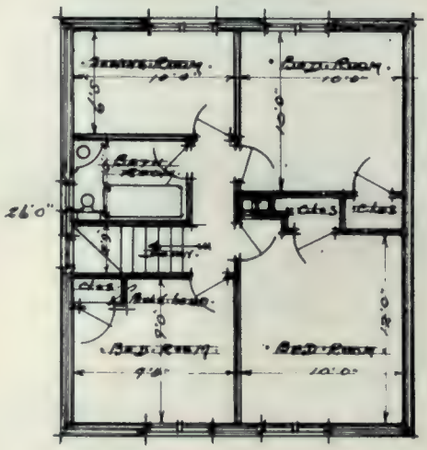
is apparent to one who observes the relations existing between the professions. Writing in the *Engineering World,* the editor states that engineers are inclined to criticize architects for not being practical, whereas architects are inclined to criticize engineers for not being artistic. Engineers prefer to execute their work without the advice of architects; architects, likewise, prefer to execute their commissions by themselves. Both groups, whether motivated by jealousy of personal attainment or by a sense of paternalism for the respective professions fail to recognize the fact that they have many interests common to each other, that very few development problems are exclusively engineering or exclusively architectural.

The reason for the estrangement is not difficult to uncover. It lies squarely in the training which the embryonic architects and engineers receive. In schools in which both engineering and architectural courses are provided, students are encouraged by their associations from the day on which they enter the professional schools, if not to be exclusive in their relations, at least not to be democratic in thtem. In schools in which only the one kind or the other of the courses is provided, the encouragement exists because of the absence of the one course or the other. The fact that the encouragement is or may be unintentional on the part of those who arrange the courses of study does not alter the consequences.

Amicable relations alone, however, between engineers and architects are incapable of relieving the state of industrial confusion and inelegance that exists. This state of affairs can



GROUND FLOOR PLAN.



UPPER FLOOR PLAN.

HOUSES ON THE LINDENLEA ESTATE, OTTAWA.
TYPES 29 & 32, LOTS 160 & 161.

HOUSE (TYPE 5A), ON LOT 65.

SPECIAL TYPE, LOT 50.

HOUSE (TYPE 5), ON LOT 6.

TYPE 35 (FOREGROUND), LOT 94.

29A TYPES.

HOUSES ON THE LINDENLEA ESTATE, OTTAWA.

F. E. BELFRY, ARCHITECT.

be relieved only when the architect knows more of the fundamental principles of engineering—more analytical mechanics—and when the engineer knows more of the fundamental principles of design; when the architect thinks in terms of quantity as well as in terms of quality, and the engineer thinks conversely. The most endurable and most beautiful structures of all history were built when the school of architecture and of engineering was one institution. The least endurable and least beautiful structures of all time have been built since the schools of architecture and of engineering have been separated. The duty of the technical schools is obvious. Let them teach engineers more architecture and architects more engineering and a more economical, more substantial, more healthful and more beautiful industrial age will occur.

Government Architectural Departments

By W. L. Somerville.

An address delivered before the Toronto Chapter of the Ontario Association of Architects.

THE subject of Government Architectural Departments has received the attention of architectural bodies and governments in England, France and the United States at various times during the last fifty years. The reason for the existence of such department has always been given as a desire to economize. Since it became the "mode" for governments to be democratic about the beginning of the nineteenth century, and "economy" became a vote-attracting policy, such departments have been on the increase.

It is interesting to note that architecture, to use a very descriptive phrase, "hit the toboggan" about the same time. Was this a coincidence, or has the withdrawal of governmental patronage contributed to this decline through the lessening of opportunity to develop the best men?

Let us consider what has happened in England and the United States. We all know that the architecture of England's public buildings is far below the excellence of her unsurpassed domestic architecture. England was, I understand, one of the first countries to establish Government architectural departments. This is significant. In the United States there have been greater opportunities for her architects through the large expenditures of private corporations, and the quick growth of the country. This has produced some of the best men in the profession. The early American Government architecture was the personal concern of the first Presidents, Washington, Jefferson and Madison, after which came a period in which the work was handled by Federal architectural departments. There is no need to describe the architecture of this period. No better argument can be presented against government architectural departments than the buildings in the United States erected by them since 1825 to the present day, except for a short period when the Tarnsey Act was in force. On the other hand, consider the numerous examples of excellent work done by private practitioners throughout the same country. The development of architecture in the United States proves beyond doubt the necessity of patronage to develop architecture.

In Canada, particularly in Ontario, and even more so in Toronto than in most other cities, we are afflicted with no less than five different Government architectural departments, and are threatened with more. At the present time there are buildings being planned for Toronto by these various departments which will cost over six million dollars. These departments are maintained by the City Architect's Department, the Board of Education, the Provincial Department of Public Works, the Provincial Secretary's Department, and the Dominion Department of Public Works. Five different organizations, working absolutely independently of one another, and each maintaining and duplicating their own offices of administration, etc. With the notable exception of the Hospital of Insane at Whitby, what have these departments produced that can be favorably compared with what has been done by private practitioners? If they are not producing better results—and the economy of maintaining them is questionable—what reason have they for existence? There is an obvious need of expert advisory and supervising Government architects and in several of these departments under discussion the heads are men of unquestionable executive ability well qualified to act as such. The trouble in these cases is not with the heads, but with the policy that has been forced on them by purely legislative bodies who are not properly informed regarding this subject.

These departments are greatly restricting the scope of the work produced by our private practitioners much more so than the invasion from the United States, from which we are asking Government protection. It practically means that a large proportion of the work done by architects in Canada is restricted to that of a residential character. Can we hope to develop men of ability to compete with those of larger opportunities in the United States? So much for the evil effects of such a system on the architecture of the country.

No doubt many will ask why it is that such departments cannot produce just as good work as a private practitioner? There are a number of very fundamental reasons, viz.:

1. Lack of competition. This removes any "spur" to bring forth the best efforts of those in the organization.

2. Interference by legislative bodies with the heads of such departments, often making it impossible for them to carry out their work according to their better judgment.

3. The difficulty of keeping good men in the service, owing to the limited opportunities for advancement. In this connection it is interesting to note that in the Supervising Architect's Department at Washington it was found that as soon as a man shows skill in construction or design he leaves the service either to practice for himself or to enter the office of some private

practitioner. Thus the work of the Government is done either by men in the undeveloped preparatory stage or by men who have not proved themselves competent to secure work outside the Government service.

Now as to the economy of maintaining such departments. Conditions are such at the present time that every Government is looking for means to economize. This accounts for the tendency to increase the number of such departments. While apparently a sound policy, experience shows that it is a fallacy, as certain facts bear out.

In 1894 the Doherty Commission, appointed to investigate the various departments at Washington, made a report in which they recommended the reorganizing of the Supervising Architect's Department, and advised that a saving to the Government would be made by making this an administrative department only and by giving the architectural work it was doing to private practitioners. While this report was made many years ago, more recent investigations have shown that the same economy would result to-day. The last investigation made in the latter part of 1914 or early in 1915, showed that the present Government system is costing some two or three per cent. more on the total expenditure for official work—draughting, clerical and superintendence—than would be necessary if private architects were employed. Owing to the poor results and excessive costs, the Board of Education at Buffalo have abandoned their architectural department and are now having all their work done by private practitioners. In 1919 the Board of Education at Hamilton considered the establishment of an architectural department, but after investigating the methods adopted in various cities in the United States, gave up the idea. They considered that the two best architectural departments in connection with school work were at Cleveland and Philadelphia. When they investigated the cost of maintenance of these departments they found that this amounted to more than the cost of retaining private architects. They also found that the schools in Boston, St. Louis and other cities designed by private practitioners were of a much higher standard.

From the brief outline of this subject it is apparent that the City of Toronto in establishing an architectural department in connection with the Board of Education, and in the recent change in the City Architect's Department, making this department productive as well as supervisory, has adopted a policy which has proved to be unsound economically in other cities. As rate-payers and citizens of this city, the architects should make this condition known to the public at large. The economic feature is the strongest argument, but the incalculable value of our civic architecture is a point that should not be forgotten. Canada's architecture is overwhelmingly mediocre at the present time; there are a few bright spots but very scattered. What is going to be the appearance of our cities of to-morrow, if the best men are to be denied any opportunity to design our public buildings? If the architects do not make some effort to remedy this condition, who is going to do it? If they take no action now, they are as much to blame for this unfortunate development as those who through ignorance and lack of experience have adopted such a policy, even more so, because it would be a public acknowledgment of an inferior position taken, compared with that of architects in other countries who are always to the fore in any movement for the betterment of the art of their country.

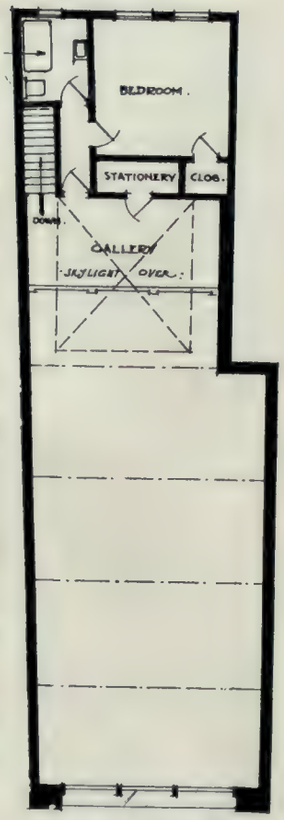
Ethics for the Contractor

To the engineer who, in the construction industry, has arrogated to himself the only professional status, it will come as a shock or as a cause for incredulous smiles to hear of the contractors discussing a code of ethics, says "Engineering News-Record." Yet they are discussing one; they are doing it seriously and honestly, and not as a camouflage measure. They go so far as to put contracting into a professional class. They conceive of themselves as service organizations accepting obligations toward a client.

This attitude, too, has a solid foundation. They are not manufacturers merely putting before a prospective purchaser a finished product which he can examine and test, and determine, with the article in hand, whether it is worth the demanded price. No, they are manufacturers employed, or as their own language would have it, "retained," to produce in the future a certain structure. Documents attempt to tell what that structure is to be; many precautions are taken to assure delivery of an article conforming to the documentary descriptions, but despite documents and drawings and contract articles what the purchaser ultimately gets depends in large measure upon factors not definable, upon the "skill, integrity, and responsibility"' of the contractor. Is it far fetched, then, to consider that the contractor has accepted a responsibility akin to the professional? We think not.

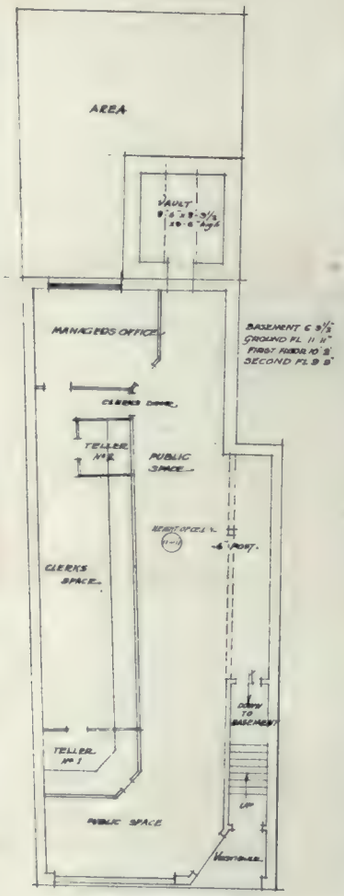
General appreciation by contractors of the character of that responsibility and serious acceptance generally of a professional code are not seen to be expected. There will be many lapses. There must be much educational work. But the attitude of engineers toward the contractors' new endeavors must be that of encouragement.

PRESENT BANKING ROOM.
MOLSONS BANK, MARKET SQUARE, HAMILTON, ONT.
PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.

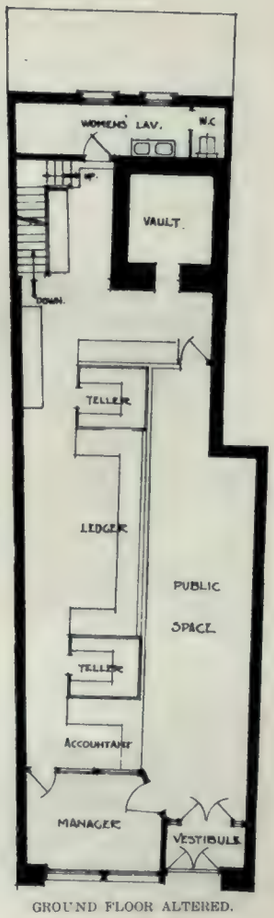


MEZZANINE FLOOR PLAN.

EXTERIOR BEFORE REMODELLING.



ORIGINAL PLAN.



GROUND FLOOR ALTERED.

Some Recent Buildings of the Molsons Bank

SINCE the Armistice and during the last two years the banking institutions of the Dominion have undertaken considerable work in the matter of erecting new buildings and remodelling and altering old offices. The illustrations accompanying this article are typical of this development and show some interesting examples of problems which arise from time to time in an architect's practice, the character of which is governed in many cases by special local conditions.

At Ayr, and old and ugly timber framed building was purchased, and no other building being available for a temporary banking office, business had to be carried on during the whole of the time that the building operations were going on.

The frame of the old building consisting of heavy timbers all framed together, has been retained, as the ground being undermined by the river at the rear, did not allow for masonry walls to be built except at very heavy expense.

The interior of the building has been entirely remodelled with a new vault, hot water heating, plumbing and manager's residence on the upper floor.

At Kitchener, a dark office with a ceiling eleven feet six inches high only has been entirely altered by removing the floor above and giving the extra height to the banking room. The office in consequence is now twenty-two feet high, and with a large skylight and window over the roof at the rear, the lighting is all to be desired.

The exterior, previously unpretentious, has been rebuilt in stone with metal window frames and bronze doors giving to the office an abundance of daylight and the building an imposing character which was lacking before the alteration. The upper floor has been remodelled into quarters for the janitor and room for the staff.

MARKET SQUARE BRANCH.
MOLSONS BANK, HAMILTON, ONT.
PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.

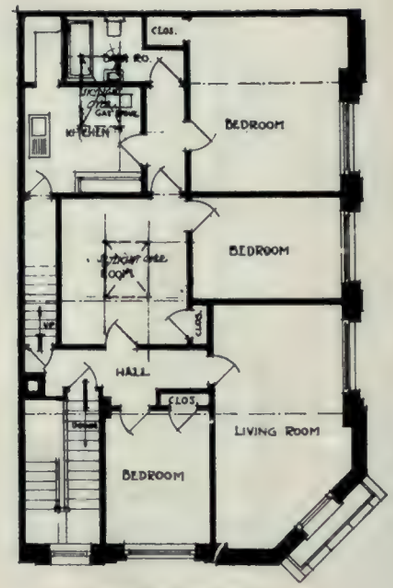
Williamsburg is a small country town several miles from any railway, and an attempt has been made to design a bank office building of a character suited to the surrounding country. The site being of ample proportions, the building covers more ground than is usual, and is so designed to provide a residence for the manager

EXTERIOR VIEW.

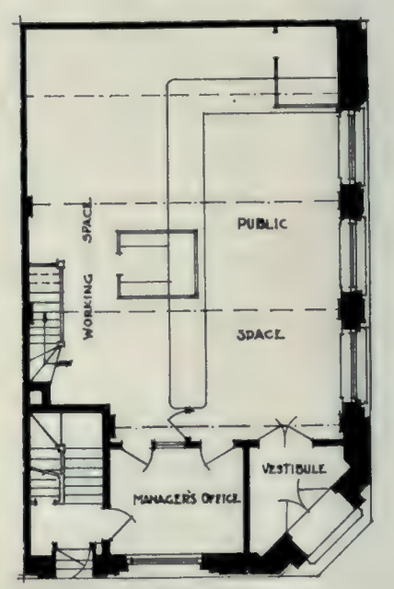
INTERIOR VIEW.

BRANCH OFFICE, MOLSONS BANK, PARK & BERNARD AVENUES, MONTREAL.

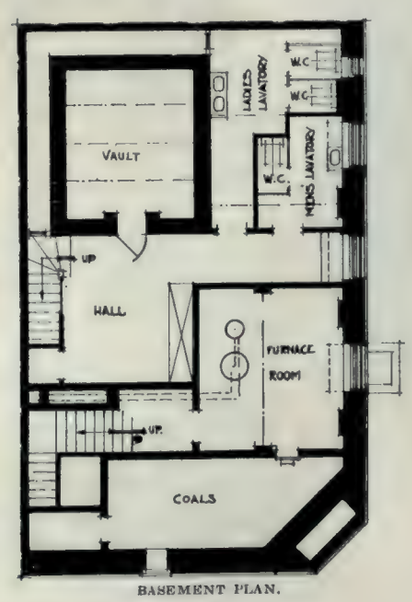
PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.



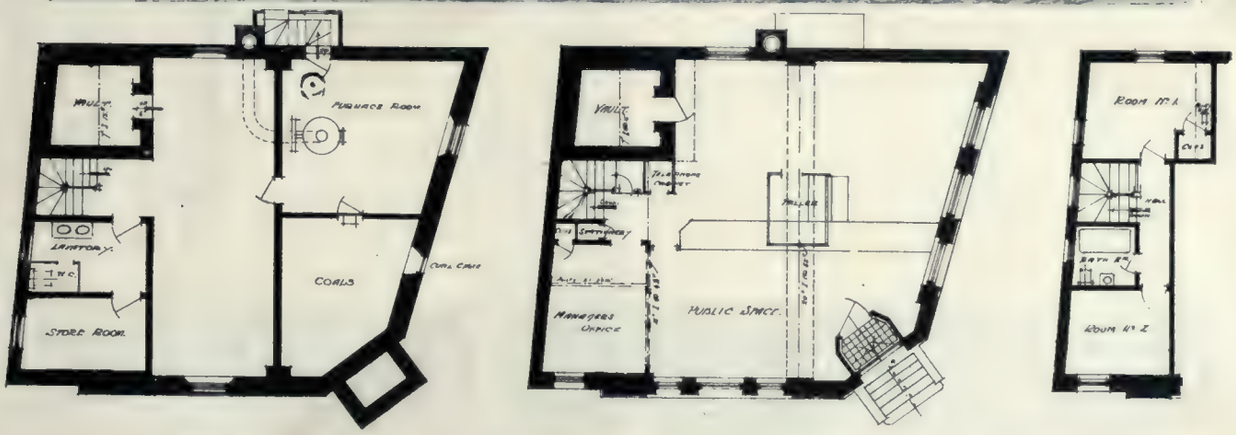
UPPER FLOOR PLAN.



LOWER FLOOR PLAN.



BASEMENT PLAN.



BASEMENT PLAN. GROUND FLOOR PLAN. MEZZANINE FLOOR PLAN.

BRANCH OF THE MOLSONS BANK, BEDFORD, P. Q.

PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.

as well as an office for the bank, and in a style that can be considered to be more domestic in character than the usual square box type of building so common in the larger towns.

The principal materials used on the exterior are rough cast cement on galvanized iron metal lath, with grey asbestos slates. The whole of the interior is of chestnut natural finish and birch floors. The residence has all modern improvements and water supply.

At Bedford a one storey building has been designed for an irregular site. Sufficient height has been given to the ceiling to allow for two rooms and bathroom for members of the staff. Plastic bricks have been used for the exterior walls.

Market Square Branch, Hamilton, presented a problem similar to that at Kitchener above described, and the same kind of treatment has been used in the design with the exception that the upper floor has not been retained. The office is twenty-three feet high, whereas previously it was only twelve feet.

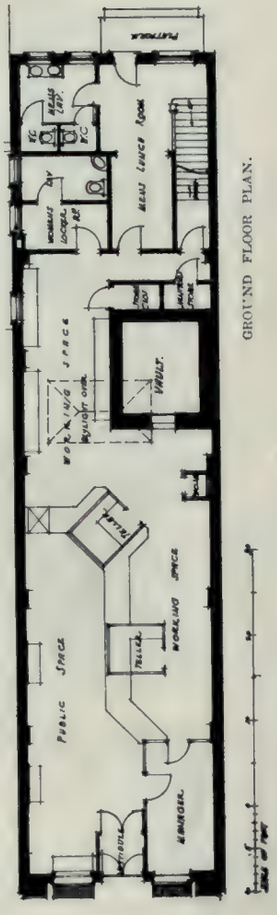
An interesting feature in this office is the mezzanine floor and gallery containing rooms for the staff and additional working space for the office.

The alterations were made whilst the business of the office was being carried on, all work on the ceiling and upper portions of banking room being completed before the middle floor was removed.

St. Thomas East Branch. This office at the corner of Talbot and Flora Streets replaces the premises previously occupied at the corner of John and Talbot Streets.

The building is designed for extensions as may be necessary in the future, and is carried out in Indiana limestone. Offices with all modern conveniences are provided on the upper floor. The fittings inside the banking room are of quartered oak with a terrazzo floor in the

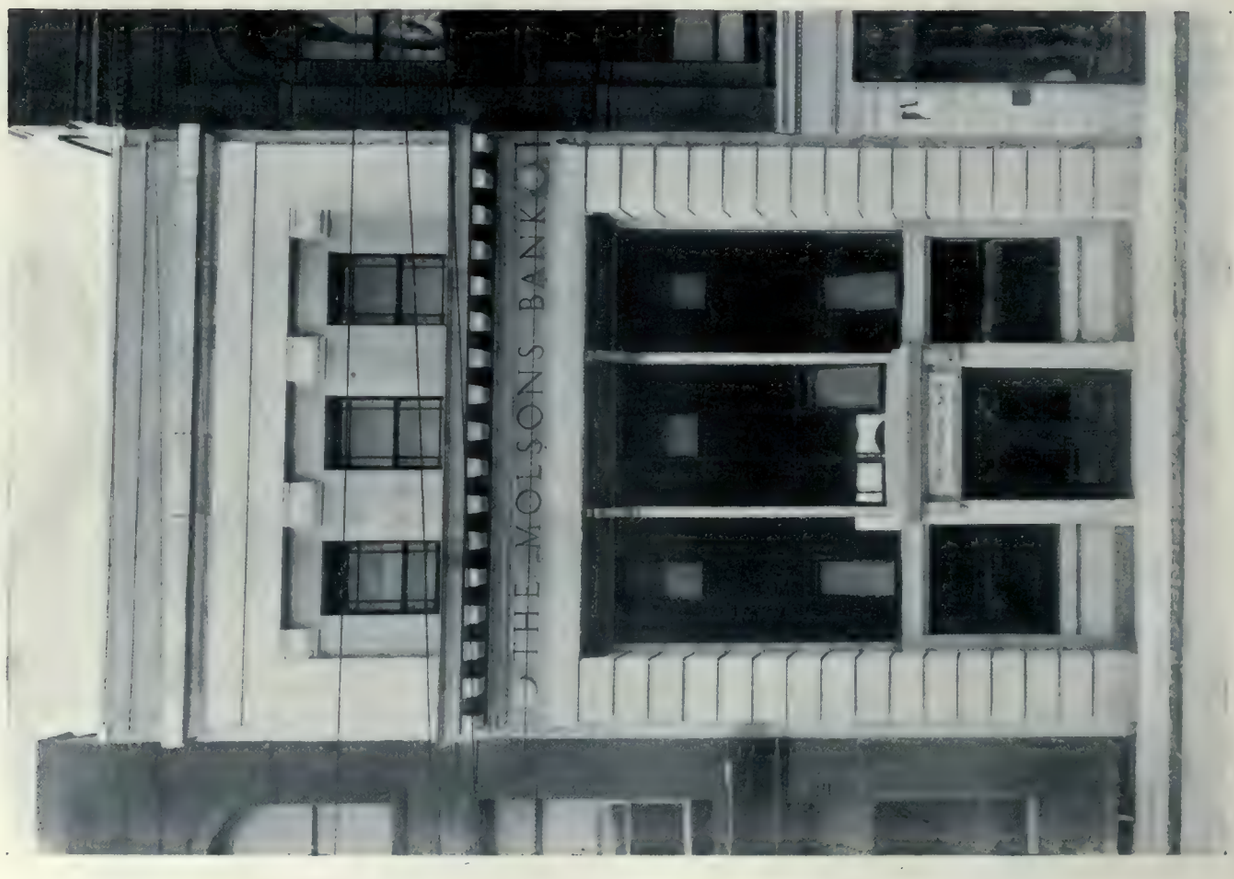
ORIGINAL EXTERIOR.



GROUND FLOOR PLAN.

BRANCH OF THE MOLSONS BANK, KITCHENER, ONT.

PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.



REMODELLED EXTERIOR.

public space. Bronze name plates and grilles to the entrance doors have yet to be added to the exterior.

Park and Bernard Avenue Branch, Montreal. This office has been built of Montreal limestone at the important corner of Park and Bernard Avenues to replace the building erected in 1911 and which is situated near by. The upper floor has been laid out for a manager's residence and is so arranged that it can be converted into public offices at a later date if desired.

Owing to the size of the site, and to give all the room possible to the working space, the vault has been placed in the basement and the hall adjoining fitted up for the use of customers renting safety deposit boxes.

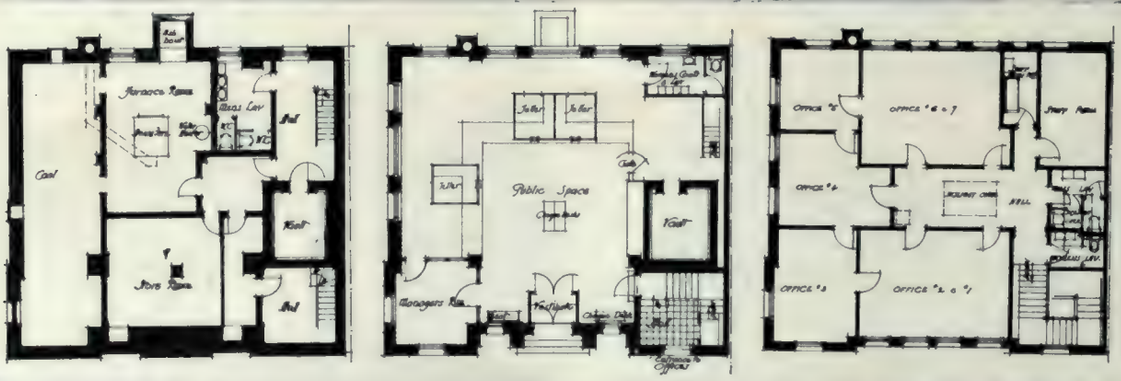
The fixtures and woodwork of the banking room are all carried out in mahogany with a black marble base. The floor is of ceramic mosaic in black and white to the architect's design. The walls are colored grey, whilst the moldings to the plaster panels and the ceiling beams are left white.

VIEW TOWARDS MANAGER'S OFFICE: MOLSONS BANK, KITCHENER, ONT.

Forest Experimental Station

The Dominion Government established about four years ago under the Forestry Branch of the Department of the Interior, a forest experimental station at Petawawa, Ont. This is on a part of the military reservation that is not required at the present time for military purposes. The tract is admirably situated for the purpose, as it is in a territory from which the timber has been cut in the past fifty or sixty years, and the new forest is coming on in various stages of growth and different kinds of trees. The tract resembles so much of the iut-over lands in Ontario and Quebec that the results of the experiments made in it will be applicable over a great extent of Eastern Canada. The experiments cover too wide a range to be gone into in a brief note, but, in a word, the result will be to show how quickly forests of different kinds of trees grow, and how best to handle a cut-over or burned-over forest area in order to get a crop of pine, or spruce, or birch, or any other desired tree ready for the saw. Already valuable information has been secured and this will be increased as each year goes by and the effects of the different methods of treatment become visible.

VIEW OF BANKING ROOM: MOLSONS BANK, KITCHENER, ONT.



BASEMENT, GROUND FLOOR AND UPPER FLOOR PLANS.

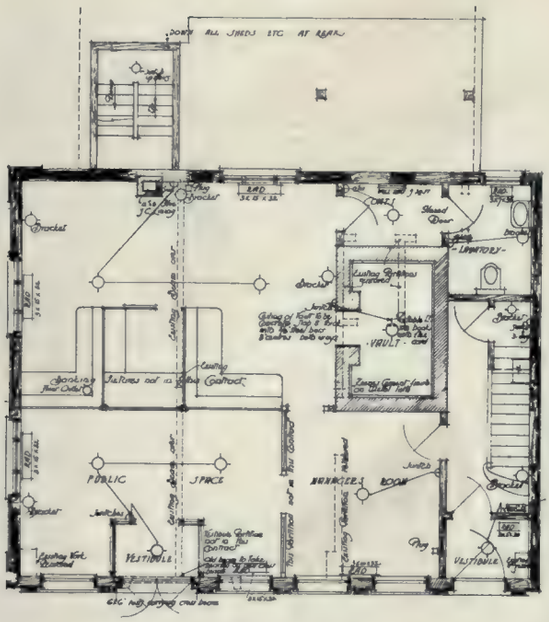
BRANCH OF THE MOLSONS BANK, ST. THOMAS EAST, ONT.

PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.

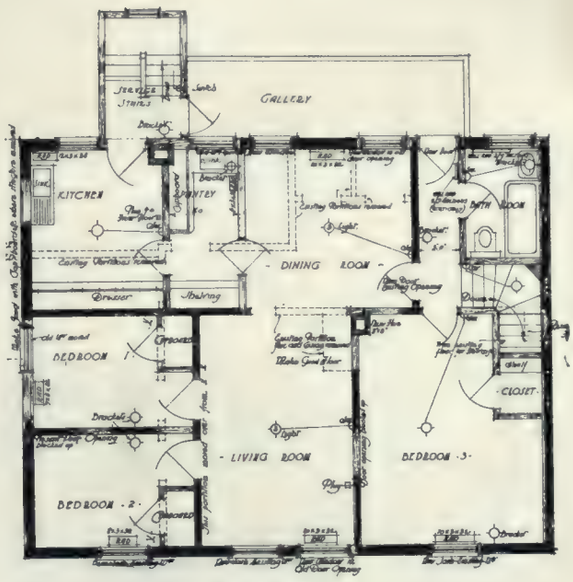
BANKING ROOM.

END VIEW.

FRONT VIEW.



GROUND FLOOR PLAN.

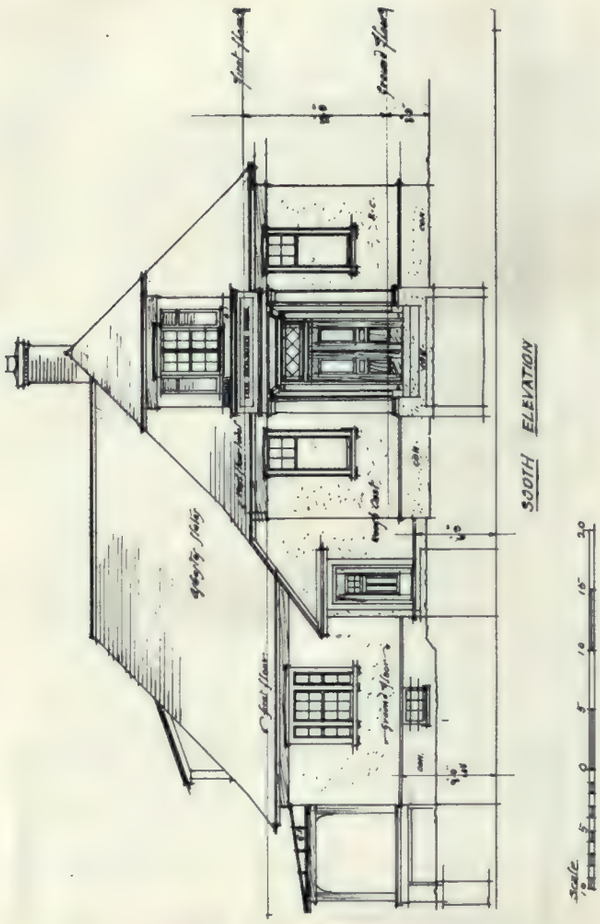


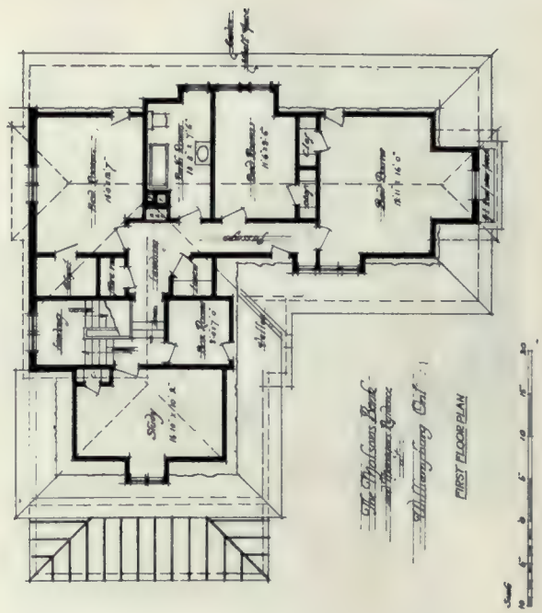
UPPER FLOOR PLAN.

REMODELLED BRANCH OF THE MOLSONS BANK, AYR, ONT.

PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.

AYR, ONT., BRANCH, BEFORE ALTERATIONS.





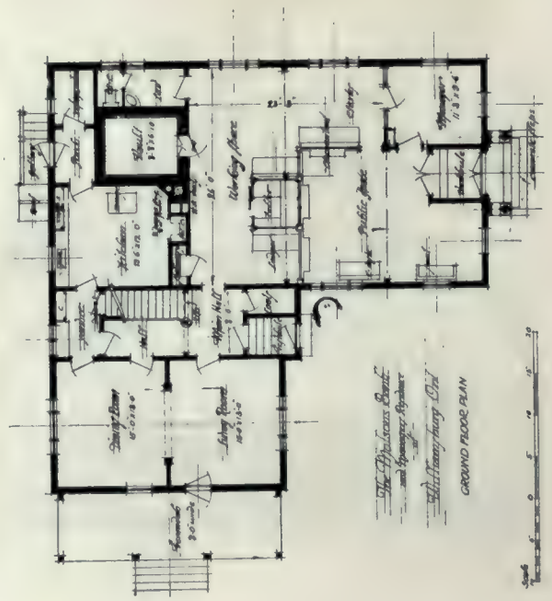
SOUTH ELEVATION

UPPER FLOOR PLAN.

BRANCH OF
THE MOLSONS BANK,
WILLIAMSBURG, ONT.

PHILLIP J. TURNER, F.R.I.B.A.,
ARCHITECT.

EXTERIOR VIEW.



GROUND FLOOR PLAN.

Architectural Management

By Francis B. Ellis, Architect

DESIGN is the exhaustive process of originating. Somehow the architectural designer seems always to feel this exhaustion more than any of the other classes of designers. This is mainly due, I feel sure, to temperament. Your most difficult problem in organization will be the constant opposition of that element known as the artistic temperament. The only way to deal with it is to understand it and to sympathize with it, but never to give in to it in such a way as to sacrifice business principles. From the point of view of production, the architectural designer is the most important man employed by the firm, as he roduces that by which the firm will most often be judged. His work will be under the guidance of the members of the firm, and all those with authority to influence the character of representative production. This designer must understand and personally sympathize with the style and character of architecture representative of the firm's reputation. Sketches are given at the start showing the original thought or inspiration, and his work will be criticized as it is produced—but he must have the authority to go ahead and design with as little loss of time as possible. The point that must be clear, however, is that there are other things as important as pleasing the eye. Never let the architectural designer feel that he can do just as he pleases; he must design for the best interests of the firm as a whole, always. We architects must work constantly to overcome the popular idea that an architect is simply a long-haired, black-tied individual, who produces pictures and plans, and nothing much more than that, and that any Lady's Weekly can give the same service for a few dollars. Nothing tends more to carry out this popular mistaken idea than to have the architect put too much stress on architectural design and silly little hard-to-understand sketchy sketches—and not enough stress on the business end of the problem. Architecaural design *must* be practical, it must be honest, it must not be wasteful—either in time, money, material or labor. A very important consideration is that when the design is once well under way it must be strictly followed. The habit of changing the mind indulged in by so many designers must be stopped. You cannot stop your client from changing his mind if he constantly sees you doing it within your own organization.

The hardest nut of all to crack is that old one which threatens good architecture for the sake of the client's own personal tastes. It is largely a matter of opinion as to how much the client should have to say about the design of the building, but after all, whose building is it? Who holds the purse? And should not the finished product show something of the individual taste of the owner? are all perfectly fair questions. Therefore the designer should look upon the condition as a condition of the problem—and he should eliminate the bad, save the good and make the best of the indifferent—in other words, tact and diplomacy, two items so often found missing in the makeup of the architectural designer, must somehow be supplied. In short, the designer must understand that he is working for a business concern, on a business basis—that his firm must make a fair profit—and that he must produce a good business investment for the client.

DIVISION OF STRUCTURAL DESIGN

In this department you find as much temperament as in the architectural department, only of a different and not easily recognized sort. The tructural man is constantly very conscious of having about the only man's job there is on the face of the earth, and, above all, is he always conscious of the silly, senselessness of (what he calls) architecture; he is willing to allow it to live, it is his gracious condescension which allows that unnecessary, effeminate being, the architect to hang upon the building a few senseless ornaments. This is about the most unfortunate attitude possible, as it does not tend to tame the wildly sensitive feelings of the gentle architect and, consequently, wrecks the team play that must exist in the organization. Fortunately, all structural men are not in this unfortunate condition; some there are who know that order and architecture are terms meaning about the same things, and that a beautiful result is much more likely to aid the engineering solution than retard it.

Some architects prefer having this structural work done outside, using as an argument that engineering problems should be done by engineer specialists. It depends largely on the size of the firm and the kind of work to be handled. You should always be able to handle the ordinary, simple problems of construction, and should have at least one good expert structural designer to advise and aid you throughout all your structural problems. The greatest argument for keeping all this structural work within your family is that in so doing you are making your concern just so much more broadly architectural—and the concern that does has

the advantage over the concern that does not. Often you can combine experts, for instance, the structural designer sometimes can head the material and specification division—it is often found that the same designer can, under ordinary conditions, handle the work of the division of mechanical and service design. All this will depend largely upon the conditions of business and of the sort of work to be handled—it would be best to maintain the various divisions, however, and be ready at all times to man them for fighting strength.

Structure is a part of architecture, and is of as much importance to the reputation of the firm as any other consideration. Your structure fails, and your architecture has failed. The demands of the structural designer will often require the alteration of some very pet idea of the architectural designer, and it will often be that the structural designer will have to do some special structural design to save some very desirable architectural feature. The laws of pure architectural design are as important as the laws of statics, though perhaps less logical and less understood. Therefore you must have a structural designer who will be proud to do his part toward helping the finished structure to appear well, and to advertise the firm's work from this point of view as well as any other. He and your other designers must work together with free understanding and respect for one another, and must have that perfect team play which must evist for the life and success of the organization.

DIVISION OF MATERIAL DESIGN AND SPECIFICATION

I have spoken of the possibility of combining the duties of this designer with those of some one of the others. I do not consider, however, that this would be at all the ideal thing to do, as the duties of this man will be extremely numerous unadulterated. This designer should be the practical business man, the connecting link between the firm and the outside business world. He must know building law, contract law, and be somewhat of a legal mind. He must follow the markets—the material market, the labor market, and, to a certain extent, the stock market, so as to keep informed as to the business outlook. He must keep cost and price records and tendencies, so that he can handle estimates with reasonable assurance. He must file samples and catalogues and keep himself informed on all the most modern methods, processes and materials as to their relative values, uses and merits. He must follow closely the running and overhead expenses of the organization—must keep the books, the diary, the journals—and keep track of the finances. He must either be a bonded employe or a member of the firm. It is easy to see that this division will be a very busy one, and one demanding very clear and particular management — with specifications to write records and progress charts to keep to date, and all the study to keep up with the progress of the outside world.

DIVISION OF MECHANICAL AND SERVICE DESIGN

The duties of this division depend largely on the type of work indulged in by the concern. Heating layouts, electric equipments, power plants, elevator installations, incineration, refrigeration, laboratory and school equipments, plumbing, ventilation, etc., etc.—all come under this department. Oftentimes this work can be taken care of best by outside experts, but here again it is best if the conditions of the problem can be handled inside the organization — it makes a much better impression upon the client.

DRAFTING DEPARTMENT

Each of the design divisions should have its representative draftsmen, with the exception of the material and specification division. This latter division should be represented by clerks and stenographers, instead of by draftsmen, but these should rate as draftsmen and be classified as the drafting department of that division.

The head of this department should be known as the head or chief draftsman. He must rate as high as the man at the head of the design department and must be considered as important a man as you have in your organization. These draftsmen, clerks and stenographers are to produce, and this department might well be called the production department—as the other department is called the dsign department. All that has been said about the designers applies also to the draftsmen. The designers have produced certain original designs, and the draftsmen must carry them out in the original spirit with the least possible delay. The chief designers shall, of course, have full authority to follow the development of the drawings and can request the chief draftsman to do thus and so, with the object of aiding in correct interpretation of the designs. But this overseeing and criticism on the part of the designer should not delay the progress of the work, and the authority for any changing of that which has already been done must come from the chief draftsman. Your drafting room can be arranged to fit your business; it is a good plan to make each draftsman feel himself a part of your organization—each man holding a definite position. As I said before, do not have anything in the dark; give each man to understand what he is for, his value to the system, his chances to advance, what his next position is likely to be, etc., etc. A good order is as follows: chief draftsman, assistant chief, squad chief, assistant squad chiefs, checkers, draftsmen (in order of rank(, squad clerks

and office boys. Every man should have his understudy, and every understudy should be trained at all times to step into his substitute position at any time. The dividing of the force into squads is like forming teams, and has a tremendous advantage; it is a scheme used in many of the largest drafting rooms.

One point to be remembered in your endeavor to make your organization a unit is that each worker is a part of the whole. The finished result, whatever it is, is the work of one as well as another of the workers. One thing every man has a perfect right to in this world is just credit for what he does—a knowledge that what he does is valued and recognized. When the organization makes a promise to do a certain work and get it done on a certain date, every part of the organization must know that promise and each worker in that organization must feel his share of the responsibility to make good that promise. A job has been contratced for—the manager and his various chiefs get together and a time schedule is worked out—a reasonable and workable schedule—this is then the promise of the firm, and all are equally responsible for living up to that schedule. After the approved sketches are made, the burden of production, and production on time, rests with the drafting department.

The chief draftsman must be constantly on the job, he must know each man in his department, must follow closely all the work and its progress, give encouragement where it is needed, know where t ogive credit, and where to place blame. He must not be in any sense either a "floor-walker" or a "pussy-foot," but he must simply be a manager, with direct wires through to the boss, the client, and the outside world. He shall have full power to "hire or fire," and as far as the men in the drafting room are concerned, he is boss. The chief shall keep careful records of the value of each draftsman—such points as speed, accuracy, faithful? ness, loyalty, punctuality, honesty, neatness, personality, tact, etc., etc., are all means for comparison between men, and it is easy to keep a strictly private comparative record of the draftsmen's ability based on these points. Such a record gives, at a moment's notice, just who is in line for a raise, just who is in line for demotion, and just who is in line for release. A record such as this shows improvement or decline, and is of particular value in this way. It is well to have it known by all the men that this sort of record is kept, however, as the knowledge does no harm and as it indicates the desire to deal fairly and equally with all concerned.

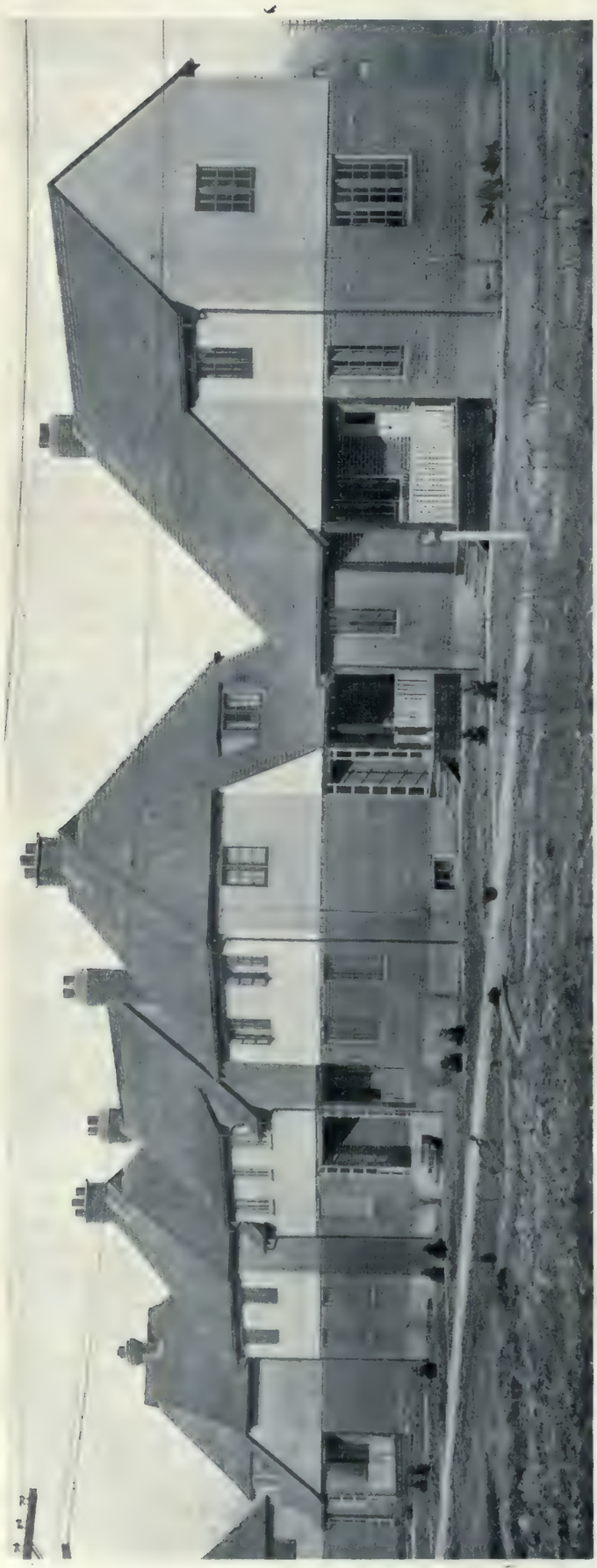
It is best, during the period of design, to have one of the draftsmen on the problem with the designer; thus it can be seen this draftsman will be able to take an active part in the interpreting of the designer's original ideas. This has another advantage; it trains some of your best draftsmen later to take positions in the design division.

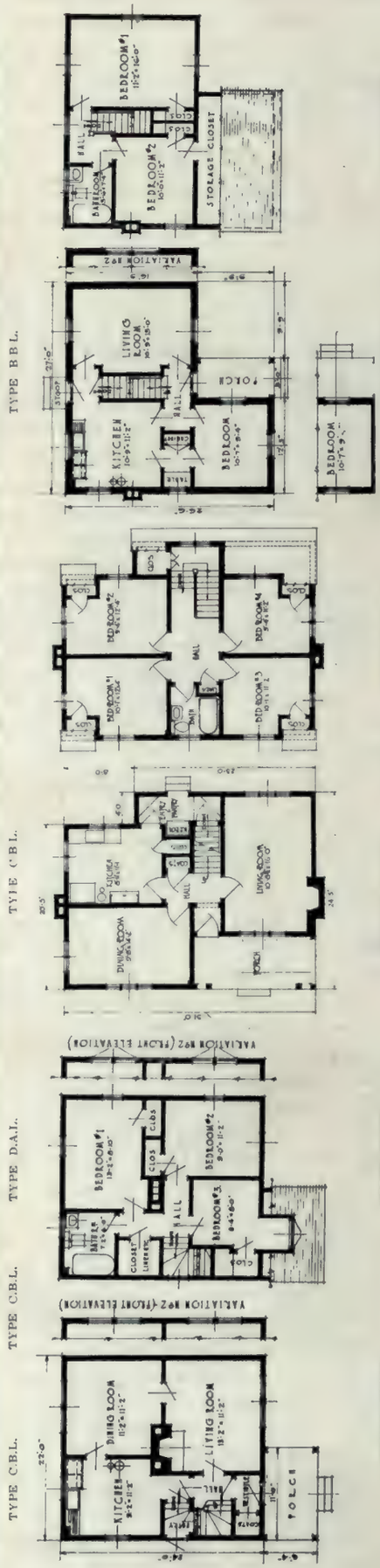
Time schedules must be very strictly checked up, certain portions of the work must be finished on certain dates, and progress of the work must be constantly recorded with particular care. Each and every drawing shall have its "due date" and each one must be unfailingly finished on that date. It shall constitute one of the greatest and most serious errors and failures to allow a drawing to run over its "due date," as it is that that shall be regarded as a violation of the company's promise. It must be constantly pointed out that it is no more unreasonable to require a working drawing to be finished on time than a competition drawing. Of course, there will be circumstances outside the control of the drafting department that may demand delay, but in such cases the claim for time extension must be put to the proper authorities at once, otherwise the original "due date" will stand. This time extension can only be granted by those who originated the time schedule. The chief draftsman must at all times keep the business manager informed on all drafting room progress and production data. Drafting room salaries shall be settled by the chief draftsman, with the approval of the business manager, but one important point should be understood by all at the start, and that is that raises will only be give at certain definite times during the year, and if a man is in line for a raise he will get it. Of course, business conditions may not always allow the firm to give raises when these dates arrive. In those cases the men must feel themselves thankful for their jobs and pull hard for better times. The advantage of such an understanding is perfectly plain; your men will not constantly be hanging around asking for raises.

Time cards and progress charts are to be kept by each draftsman. A certain amount of this dry systematic recording is good for the men—it develops valuable qualities and offsets some very unfortunate habits too often looked upon as being earmarks of architects.—*The American Architect.*

Building Small Apartments

According to a news item apartments of three or four rooms with a full sized kitchen, renting from $50 to $60 a month are features of this year's building program as formulated in New York City by the Builders' Association of Manhattan.

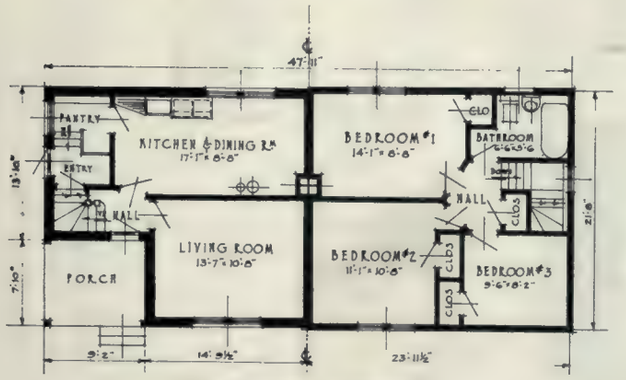




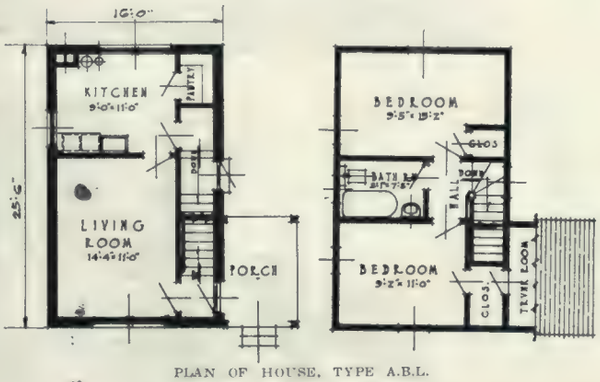
HOUSING DEVELOPMENT AT HAMILTON, ONT.

W. L. SOMERVILLE, ARCHITECT.

TYPE A.B.L. TYPE B.A.2. TYPE A.B.L.



PLAN OF HOUSE, TYPE B.A.2.



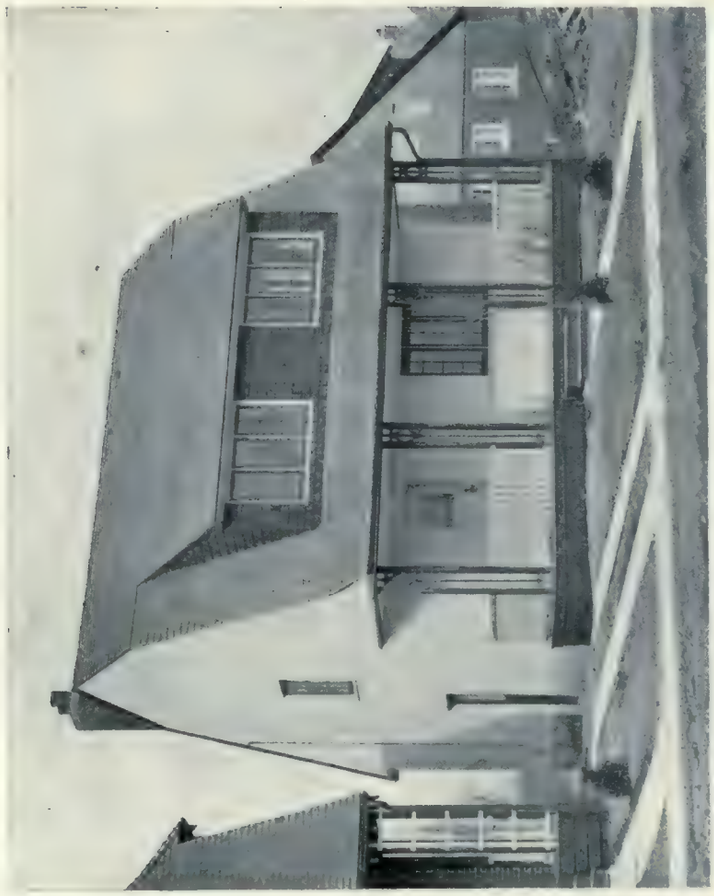
PLAN OF HOUSE, TYPE A.B.L.

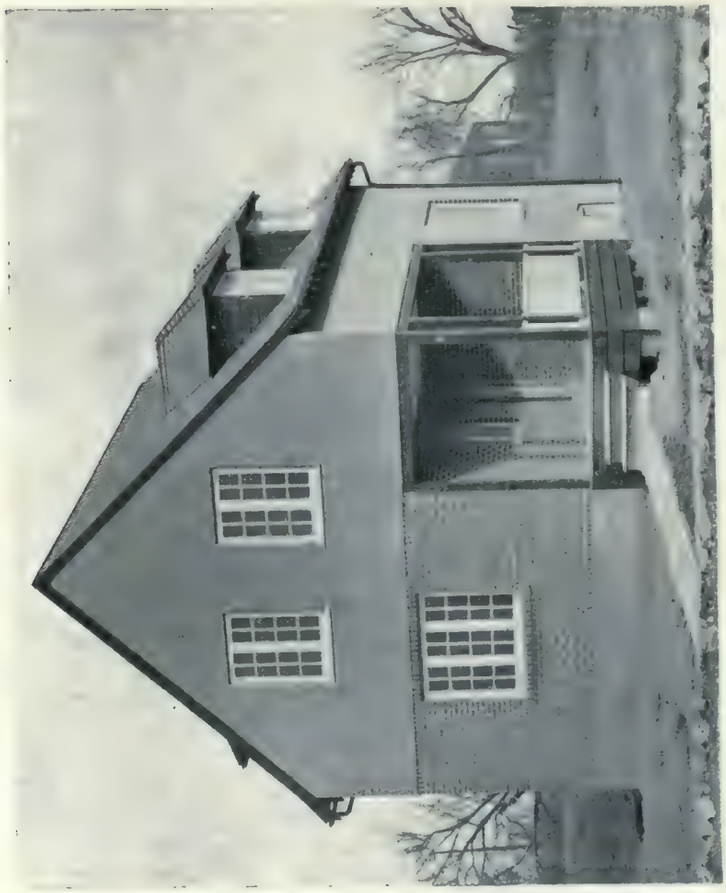
HOUSING DEVELOPMENT AT HAMILTON, ONT.

Housing Development at Hamilton

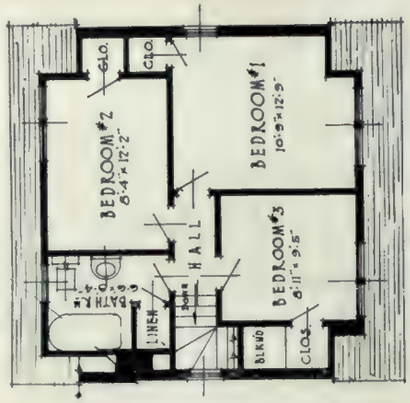
THIS development is the first unit of the westward extension of the city of Hamilton, and is the first garden city development on a large scale to be undertaken in Canada. The property, comprising about six hundred acres, is owned by the McKittrick Properties, Ltd., of Hamilton. Early in 1919 Robert Anderson Pope, Town Planner; D. McDonough, Realtor, and W. L. Sommerville, Architect, were retained to make a report to this company advising them as to the best method of development and procedure for marketing of this land. Following the submission of this report, Mr. Pope was retained to make the town plan which was completed by Ferdinand Good under the direction of F. K. Hamilton, the general manager of the company, late in the year.

The plan calls for the creation of a shopping centre and wide business street, which is an extension of King Street, the principle business street of Hamilton. School sites, public parks and play grounds are also planned. The property is separated from the city by a deep ravine which is spanned by a steel bridge over which the electric surface cars enter the property. The property has an irregular boundary on the north formed by deep, heavily-wooded ravines which are reserved as public parks. The new Hamilton-Brantford Provincial Highway forms the southern boundary.

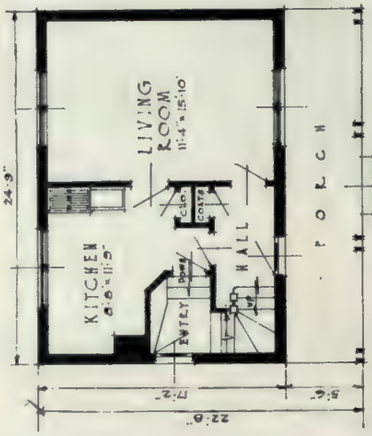




TYPE B.A.L.



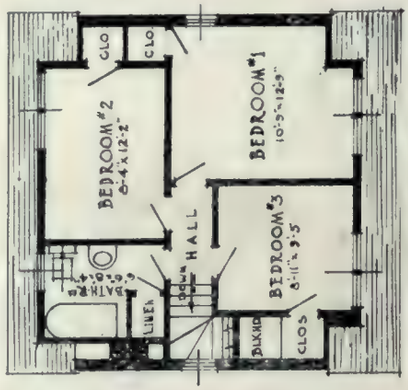
UPPER FLOOR PLAN.



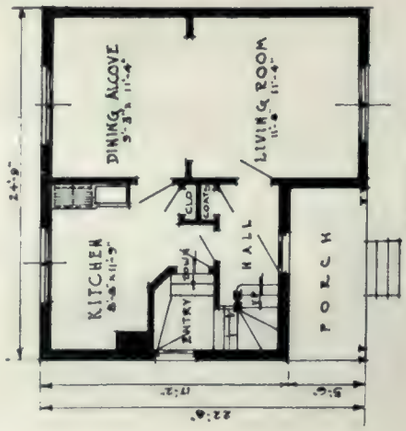
GROUND FLOOR PLAN.

W. L. SOMERVILLE, ARCHITECT.

TYPE C.C.L.

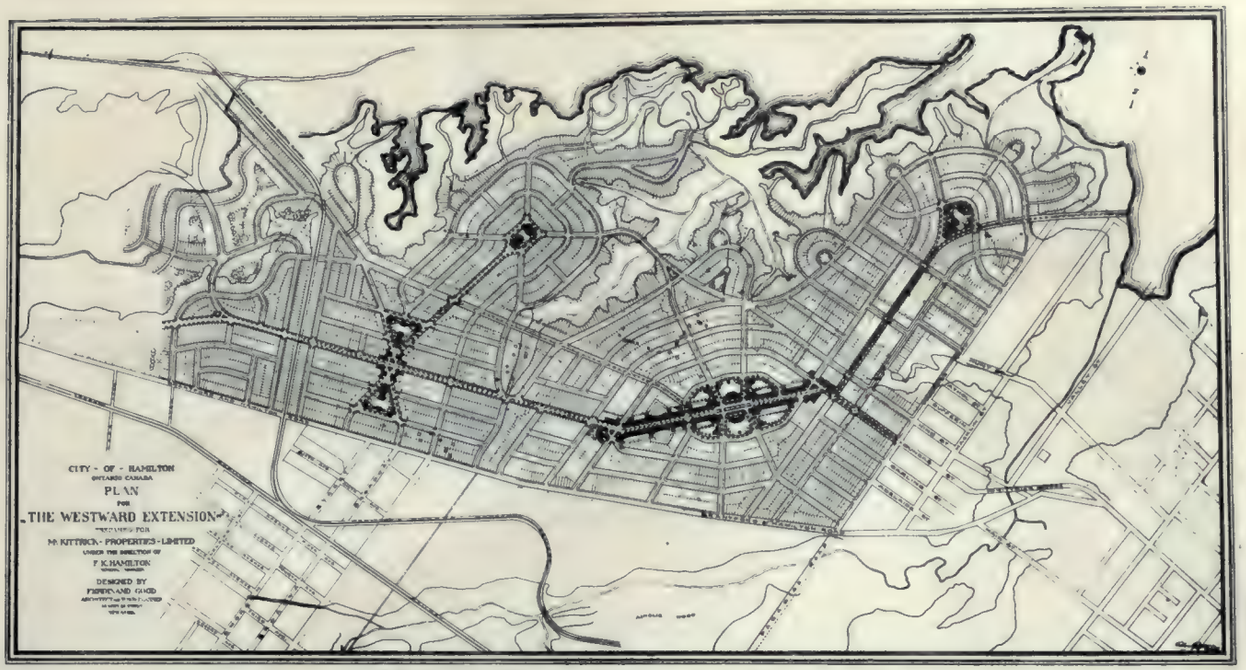


UPPER FLOOR PLAN.



GROUND FLOOR PLAN.

HOUSING DEVELOPMENT AT HAMILTON, ONT.



HOUSING DEVELOPMENT AT HAMILTON, ONT.

While the town plan was being completed, Mr. W. L. Somerville was retained as architect and plans were prepared for the first houses to be built. It was decided to build them at the eastern entrance to the property, the most difficult portion to develop and the least favored by natural advantages. Construction was started in March, 1920.

The types selected for the first houses comprise four, five, and six-room types, detached, except one semi-detached five-room type. These types were varied in order to find out which ones would be the most popular. The four-room cottages, type A.c.l., were the first to be sold and brought a demand equal to that for the six-room two full story house, type C.b.l. There was very little demand for the five or seven-room types. The six-room type C.b.l. was apparently more favored than type C.a.l., as it had a fire place.

In order to get the best prices on materials it was necessary to buy in large quantities. To overcome the monotony, the result of using similar materials on all the houses, considerable attention was given to the color schemes and to the grouping of the houses. The porch posts and beams are stained dark brown and moss green. The brick is an orange red common kiln run laid with a wide grey joint. The entrance doors are painted either cream white or dark bottle green with cream white frames. The window sash are picked out in bright colors on the different houses, orange red, apple green, cream white, and on the cottages which have

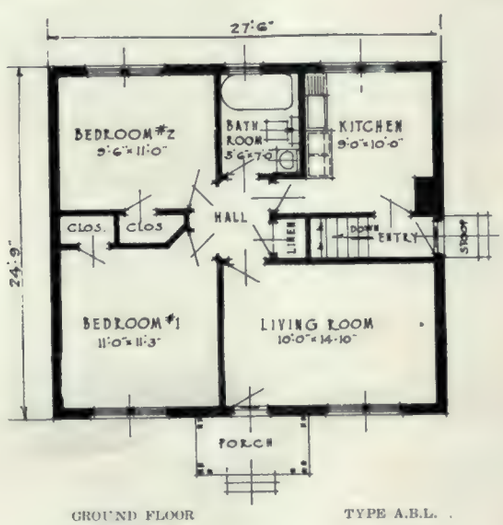
TYPE C.B.2. TYPE C.C.2. TYPE C.C.1. TYPE C.B.2.

HOUSING DEVELOPMENT AT HAMILTON, ONT.

W. L. SOMERVILLE, ARCHITECT.

TYPE B.A.L. TYPE A.B.L. TYPE B.A.L.

HOUSING DEVELOPMENT AT HAMILTON, ONT.



GROUND FLOOR TYPE A.B.L.

W. L. SOMERVILLE, ARCHITECT.

white window frames and a green lattice porch, the sash are black. The frames in all cases are cream white. The roofs are all shingle, stained a dark brown in some cases and in others allowed to weather. The stucco is a light grey on most of the houses, on a few it is tinted a warm cream color and on one a light greenish grey, the porch posts on this house being dark green, the window frames cream white and the sash orange red.

Most of the houses were built with the lower storey walls of brick eight inch thick, the upper storey of studs with sheeting paper, strapping and metal lath. A few have the upper story covered with shingle instead of stucco and three of the houses are all stucco.

The interior trim and doors throughout the first floor are chestnut stained; on the second floor pine was used and is painted.

The houses were built by the T. G. Thompson Construction Co. of Hamilton at an average cost of a little over $4,000 each, one-half of the total number of houses being six and seven-room types.

There are now four forest schools organized as departments of Canadian universities. These in the order of their establishment are Toronto, Laval, New Brunswick and British Columbia. The last named school was organized in the past few months.

Building Materials and Prices

WHAT is most needed to-day to vitalize and to effect an improvement in the building industry? Is it a further readjustment in the prices of materials and labor, or is it the need of recognition on the part of the public that prices of building commodities and wages are as low as can be expected for some time to come. So much has been said in the daily press about high prices of materials and the inefficiency of labor that the fear of a reaction and falling values have prevented a large number of investors from proceeding with contemplated work. There is no question but this has had a most important bearing in retarding building operations up to the present time this season.

The difficulty is that the public during the period of rising costs, figured that when the peak was reached and the reaction set in, a drop to pre-war prices would result. Needless to say that such has not been the case, and it is becoming more apparent that a gradual lowering of materials combined with a gradual decrease in the cost of living is the best that can be expected. The fact of the matter is prices on some forty basis material show a reduction as compared with last year's levels, while the production of labor as regards the building trades is reported to have improved to an extent which is steadily bringing its output up to a normal standard. This it is felt should stimulate activities and give encouragement to owners to proceed with necessary buildings. With the better class of residential and commercial work requiring high grade materials the reduction is estimated to be from 5 to 10 per cent., while contractors who have refigured jobs estimated on last year's claim, in some cases, a saving as high as 15 per cent. can be effected.

In fact the consensus of opinion based on replies to a questionaire recently sent out by Construction is that building costs will not recede to any great extent from where they are to-day. True, there have been some additional slight decreases noted within the past few weeks, but further deflation, it is contended, will only come in the course of a very gradual process affecting the readjustment in all other lines of industry. The present rate of assessment on which taxes are based is pointed to as a fair index of values, and this has doubled on buildings since 1914.

Moreover, it is stated that notwithstanding the large number of deferred projects, there is another factor largely entering into the situation and that is the availability of material. During the early period of the war, manufacturers of certain building materials found their investment tied up in large stocks that were not moving, and this in some instances has led to a curtailment which has resulted in a number of firms carrying only a sufficient stock of goods to meet a fair market demand. Greater production would improve conditions but this can only be encouraged and brought about by speeding up building operations. The big improvement to-day must in the last analysis come from better services rendered by labor and the most hopeful sign is the report that the attitude of the workmen is to do a better day's work.

What would help matters materially would be an improvement in the money situation. One of the big factors arresting developments to-day is the high rate of interest and the difficulty of obtaining mortgage loans. Banks and loan companies, due to the fear of depreciated value, are very conservative at the present time, and in some cases have discounted the cost of buildings by 30 per cent. and then allowed a loan of 50 per cent. of the balance. So long as this condition exists it will hinder a great number of people going ahead with their building program. If it were possible, architects and contractors contend, it would do far more good to assist the prospective builder with money at a reasonable cost than to limit his possibilities of return after he has taken the risk of building under present economic conditions.

It is further suggested that the building industry would be benefitted at the present time by an arrangement to buy at face value second mortgages from builders, or in some other way to devise methods of financing, which would enable the builder to get all his cash when selling, and thus allow him to proceed with additional work. This refers mainly to the speculative builder who supplies a large percentage of small and medium sized houses.

Wages as regards labor are influenced by the cost of living and the opinion is that they will not decline to any extent this year, due to the fact that there is no great excess of skilled labor in the building trades at the present time.

As one architect points out, the actual rate of wage paid to the working man is of secondary importance to his value as a producing unit, but when wages go up and efficiency goes down, the purchaser of labor is hit both ways. That has been very much the trouble up to recent date. With labor doing better, however, to quote the same architect, a fair share of the responsibility looking towards improved conditions also rests on the shoulders of the contractor. "They must be intelligently organized and prepared to do work for a fair compensation over known costs. The days of guessing are over, waste must be eliminated, and, wherever possible, labor saving devices resorted to. They must also be organized in such a way that

the increasing or decreasing of their actual building staffs must be brought about with the minimum disturbance amongst their help. The old method of engaging men by the dozen one day and dismissing them a few days after is wasteful and does not make for efficient and economic results. There is no 'esprit de corps' between employer and employe. Better results, from every point of view, would be obtained from smaller staffs retained permanently and encouraged to give of the best of their labor by adequate compensation.

"The architect also must consider his profession as a 'business' which requires to show satisfactory results, not only artistically, but financially.

"A considerable change has taken place during the last seven years and the architect who continues to plan and specify as he did previous to the World War will bring financial disaster on his client and retard building. He must study costs and only specify such material as can be used economically, disabusing his mind of former methods and materials employed.

"Much more can be done towards stabilization of prices by one who is wide awake to the foregoing than can be readily imagined. Further, the days of blatant over-ornamentation are over, for some time, at any rate. What is needed is saneness, simplicity and substantiality, without waste."

Structural Materials

Statistics dealing with certin basis building materials are given in the following which is taken from a preliminary report issued by the Department of Mines, Ottawa, in reference to the mineral production of Canada:

During the war building activity was reduced to a minimum and the total value of the production of cement, clay and quarry products which had reached a maximum of $30,809,752 in 1913 had fallen to $17,467,186 in 1916, increasing to $27,221,510 in 1919.

In 1920 the value of this production had increased to a new maximum of $38,184,848. While higher prices have played an important part in this increase of over 39 per cent. in value the actual quantities of cement, brick, lime and stone produced has been considerably increased in 1920 over the 1919 production.

Cement.—The total quantity of cement sold from Canadian mills in 1920 was 6,651,980 barrels valued at $14,798,070, or an average of $2.22 per barrel as compared with sales in 1919 of 4,995,257 barrels valued at $9,802,433 or an average of $1.96 per barrel, showing an increase in quantity of 1,656,723 barrels, or 33 per cent., and an increase in total value of $4,995,637, or 51 per cent.

The total quantity of cement made in 1920 was 6,498,550 barrels as compared with 4,613,588 barrels made in 1919, an increase of 1,884,962 barrels, or 40.8 per cent.

Stocks of cement on hand January 1, 1920, were 1,089,603, and at the end of December this had been reduced to 936,173.

The exports of cement in 1920 were valued at $2,193,626 as against exports in 1919 valued at $465,954. In 1919 the value of cement exports greatly exceeded the imports for the first time. In 1820 the quantity is not reported for the first three months but is give nas 2,701,584 cwt. for the last nine months. At the average price of 74 cents per cwt. given for the last nine months the estimated quantity exported during 1920 would be 2,964,360 cwt. or 846,960 barrels of 350 pounds each.

The total imports of cement in 1920 were 115,370 cwt., equivalent to 32,963 barrels of 350 pounds each, valued at $112,466, or an average of $3.41 per barrel as compared with imports of 14,066 barrels valued at $51,314, or an average of $3.65 per barrel in 1919.

The total consumption of cement in 1920 was therefore about 5,837,983 barrels as compared with a consumption of 4,776,346 barrels in 1919, an increase of 1,061,637 barrels, or 22 per cent.

Clay Products.—The total value of the production of brick, tile, pottery and other clay products is estimated for 1920 at $10,533,271 as against a value of $7,906,366 in 1919, an increase of $2,626,905, or 33.2 per cent.

Lime.—Sales estimated at 9,355,797 bushels, valued at 3,748,463, a $nincrease of 31 per cent. in quantity and over 62 per cent. in total value. Nine firms reported sales of 35,869 tons hydrated lime, valued at $481,878, included in above.

Sand-Lime Brick.—Sales reported at 46,102 thousand brick valued at $718,735—nearly double the quantity and total value of 1919.

Stone Quarries.—Value of production is estimated at $5,163,449 as compared with $4,225,937 in 1919.

Good Progress on Big Power Scheme

Very satisfactory headway is being made on the Queenston-Chippewa power development under the fine weather conditions prevailing. The daily reports being received by the Ontario Hydro-Electric Power Commission show that the excavation, lining of the canal and erection of the power house at Queenston are proceeding beyond the daily schedule set out for the operation of two units by September next. A recent accomplishment was 9 per cent. over one day's allotment of work, and this is said to be indicative to a large extent of the progress which is being made almost daily.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:

MONTREAL—171 St. James Street.
C. S. Soutter, Representative.

WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue.
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, April. 1921 No. 4

Financing Small Houses

At the recent meeting which led to its formation, Mr. W. S. B. Armstrong, Secretary of the Town Planning Institute of Ontario, gave his views on what he regards as the ultimate solution of the financial side of the housing problem. His idea is to amend the existing Act to encourage housing accommodation in cities and towns passed by the Ontario Legislature in 1912, and which permits municipalities to guarantee the bonds of a housing company up to 85 per cent. of the money required, so as to enable the municipality to operate directly as well as through a company. This would permit a city like Toronto to organize a housing department along lines similar to the existing Roadways Branch of the Department of Works.

Under the amended Act any person who had 15 per cent. of the cost of a house could deposit the amount with the City Treasurer and when a sufficient number of applications were in, the Housing Department would advertise for tenders and tender on the work itself, just as the present Roadways Branch tenders on all roadways and sidewalks to be laid. The house would be delivered as soon as built, the city taking the first mortgage and the purchaser paying the principal and interest in fixed monthly instalments.

As housing is and will continue to be a municipal problem, and as the provisions of adequate accommodations can only be accomplished by utilizing the facilities of private builders, the suggestion has much to recommend it.

Mr. Armstrong declares that this solution is immediately feasible under existing legislation by a slight change in the wording of the Act, and that it can be carried out without disturbance of the building industry or of municipal finance. The result, he states, would be a tremendous increase in building operations. The purchaser would get his house at cost plus a reasonable profit to the builder, the discounting of second mortgages would be done away with, and people who lend money on first mortgages could invest it in municipal debentures. The municipality would be taking practically no chances of loss, because it is an established fact that losses in connection with loans on small houses is almost negligible.

Sales Tax in the Construction Industries

In reply to a number of questions addressed to the Department of Inland Revenue by the Association of Canadian Building and Construction Industries in reference to the application of the Sales Tax to the building industries, the association is advised that the Department regards building and other similar contractors and sub-contractors as being retailers, and that it does not contemplate receding from this position. The ruling of the Department in this connection is as follows:

Any materials manufactured in whole, or in part, by contractors or sub-contractors, and used by them in the course of the construction of any building, will be subject to Sales Tax at the rate of 2 per cent. on the sale and delivery of such material. To overcome the difficulty of collection from the owner of the building, contractors or sub-contractors may segregate the manufacturing section of their business from the contracting section, and will then pay Sales Tax at the rate of 2 per cent. on the sale of the manufactured material, from the manufacturing section to the contracting section, provided, however, that the tax must be computed on a valu-

ation equivalent to the price at which the manufactured material would be sold to other contractors.

A sub-contractor, who does not instal the material manufactured by him in the building, but who sells his product to the building contractor, with whom he has a contract for the furnishing of such material, will collect from the general contractor Sales Tax at the rate of 2 per cent. on the actual selling price of the material to the general contractor.

As respects structural steel companies, it would appear that their operations may be divided into three methods of contracting, viz.:

1. Supplying steel, fabricated in their own premises, delivered to the building site, and there erected into the building.

2. Partially fabricating steel on their own premises, assembling the same at the building site, during the course of erection into the building.

3. Supplying steel, fabricated in their own premises, and sold and delivered to the general contractor to be by him erected into the building.

The Sales Tax in the above instances will be payable as follows:

In the first and second instances, the manufacturing department of the steel company to be segregated from the contracting or erecting department, and Sales Tax to be computed on a basis, as outlined in the above third paragraph.

In the third instance the Sales Tax on the fabricated steel sold by a sub-contractor to the general contractor must be collected on the actual value of the sale.

As regards the specific case of a sprinkler company buying pipe in large quantities, threading and making connections before or after shipping it to the building, it is stated that such companies may be dealt with on the same basis as contractors or sub-contractors, and if they manufacture any part of the sprinkler system, the manufacturing section should be segregated from the installation or contracting section. Such contracting sprinkler companies are regarded as retailers in regard to pipe purchased by them to be used in the installation of their systems.

Sub-contractors or general contractors do not lose their identity as retailers by reason of the process of bending or wiring performed by them on reinforcing steel used in concrete construction. The contractors are regarded as retailers when purchasing such materials.

On the question of absorption of tax into the contract price, the law permits a contractor to pass the Sales Tax which he pays on his purchases on to the customer as part of said price.

Personal Items

Harries & Hall, landscape architects, Toronto, have moved their offices from 71 Bay Street to 71 King Street West.

Maurice D. Klein, architect, Toronto, until recently located at 71 Bay Street, has moved his offices to 71 King Street West.

Baron Boris de Hueck, a member of the Russian Academy of Architecture and of the British Association of Architects, arrived recently from London on the "Minnedosa" and has taken up his residence in Toronto where he has associated himself with H. B. & L. A. Dunnington-Grubb, garden architects.

The Lakewood Engineering Company, Cleveland, O., announces the appointment of Kelly-Powell Limited, 403 McArthur Building, Winnipeg, Canada, as agents for the Province of Manitoba, Saskatchewan, Alberta and Western Ontario for the sale of Lakewood paving, construction and industrial equipment.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in this Issue.

MOLSONS BANK, AYR, ONT.

Bank Fixtures, Globe Furniture Co., Waterloo, Ont.
Vault Door, J. & J. Taylor.
Electric Light Fixture, McDonald & Willson Co., Ltd.
New Front, McKinnney Lumber Co., Ltd., Woodstock.
Plubbing and Heating, Cunningham & Co., Paris, Ont.

MOLSONS BANK, KITCHENER, ONT.

Plumbing and Heating, Wm. Knell & Co.
Furniure and Fixtures, Globe Furniture Co., Ltd.
Stonework, Central Canada Cut Stone Co., Sarnia.
Electric Light Fixtures, McDonald & Willson Co., Ltd.

MOLSONS BANK, HAMILTON, ONT. (Market Square Branch).

Plumbing and Heating, Adam Clark, Ltd.
Electric Light Fixtures, McDonald & Willson Co., Ltd.
Marble, Kent, Garvin & Co.
Furniture and Fixtures, Globe Furniture Co., Waterloo, Ont.
Flooring, Marbleloid Co., of New York.
Boiler and Radiators, Warden King Ltd.

MOLSONS BANK, WILLIAMSBURG, ONT.

General Contractors, Anglin-Norcross Ltd., Montreal.
Furniture and Fixtures, Globe Furniture Co., Ltd.
Electric Light Fixtures, McDonald & Willson Co., Ltd.
Furnace, Gurney-Massey Co., Ltd.
Metal Letters, Robert Mitchell Co., Ltd.

MOLSONS BANK, BEDFORD, QUE.

General Contractors, Cook & Leitch, Montreal.
Electric Light Fixtures, McDonald & Willson Co., Ltd.
Metal Letters, Robert Mitchell Co., Ltd.
Furniture & Fixtures, G. H. Randall Co., Ltd.

MOLSONS BANK, ST. THOMAS EAST.

General Contractors, A. E. Ponsford, Ltd.
Plumbing and Heating, Hamilton & Stott.
Furniture, Canadian Office & School Furniture Co.
Electric Light Fixtures, McDonald & Willson Co., Ltd.
Vault Doors and Safe, J. & J. Taylor.
Marble Work and Floor, Smith Marble & Construction Company, Montreal.
Stone, Central Canada Cut Stone Co., Sarnia.

MOLSONS BANK, PARK and BERNARD AVE.

General Contractors, W. M. Irving, Montreal.
Plumbing and Heating, Selkirk Bros., Montreal.
Electric Wiring, Sayer Electric Co., Montreal.
Electric Light Fixtures, McDonald & Willson Co., Ltd.
Counter and Fixtures, G. H. Randall Co., Ltd.
Marble and Floor, Jas. Walker Hardware Co.
Metal Work, Dennis Wire & Iron Works, Ltd., London.
Signs, Star Sign Co., Montreal.
Hardware, Jas. Walker Hardware Co., Ltd.
Boiler, Warden King, Ltd.

Toronto, May, 1921 Vol. XIV., No. 5

CONTENTS

BIGWIN INN, LAKE OF BAYS DISTRICT 129

MONUMENTAL ARCHITECTURE AND TOWN PLANNING..... 137
By John M. Lyle, Architect.

GARAGE, SHERBROOKE, QUE. 140

APPRENTICES FOR THE BUILDING TRADES..... 141

MACHINE—MADE REINFORCED CONCRETE STRUCTURE..... 143
By F. G. Engholm, A.M.I.C.E., A.M.I.M.E., Consulting Engineer.

HALTON COUNTY REGISTRY OFFICE, MILTON, ONT. 152

O.A.A. NOTES 153

THE OTTAWA CONFERENCE 154

EDITORIAL 155
The Live Stock Arean Contract—Toronto Chapter Exhibition.

Full Page Illustrations

BIGWIN INN, LAKE OF BAYS DISTRICT..... 128

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

PERSPECTIVE.

ADMINISTRATION BUILDING.

BIGWIN INN, (NEAR HUNTSVILLE, ONT.) LAKE OF BAYS DISTRICT.

JOHN WILSON, ARCHITECT.

Bigwin Inn, Lake of Bays District

BIGWIN INN, which was opened for the reception of guests during the season of 1920, is situated on Bigwin Island, in the centre of the Lake of Bays, in the Highlands of Ontario. The island, which is in a district famed for its scenic beauty, is magnificently wooded, with many springs of clear, cool water, and with sandy beaches jutting out into the blue waters of the lake. It is two and a half miles long, more than half a mile in width, and with its score of woodland trails leading down to the water edge, forms a summer domain such as few hotels in the world possess.

With such an ideal location as a background, the promoters have conceived of a scheme of buildings which not only harmonizes to a picturesque degree with their surroundings, but which in plan and construction are of a character which lay claim to several unique features. The development has been carried out in five main units, comprising the administration building, the two sleeping lodges, the dining hall and the dance pavilion. Besides this, there are several subsidiary structures, such as the power plant, pier building, helps bungalow and the observation tower. Ideal recreation facilities are also provided in the way of a nine hole golf course, croquet and bowling greens, and well laid out grounds for tennis and baseball.

The main buildings in themselves consist of over a third of a mile of structures, all attractively designed and substantially built. The materials used are concrete and stone with asbestolate roofing, the whole being modeled with a view to making it practically fireproof.

Apart from being essentially different from the usual summer hotel housing all departments under one roof, the inn strikes a new note architecturally, and special regard has been given to its equipment and appointments in order that the guests might be assured the maximum of comfort. Accommodations are provided for five hundred guests. In addition to the sleeping lodges, which contain approximately three hundred rooms, the majority of which are equipped with twin bed, there are twenty large bed rooms in the administration building, which are reserved for a limited number of week-end transients.

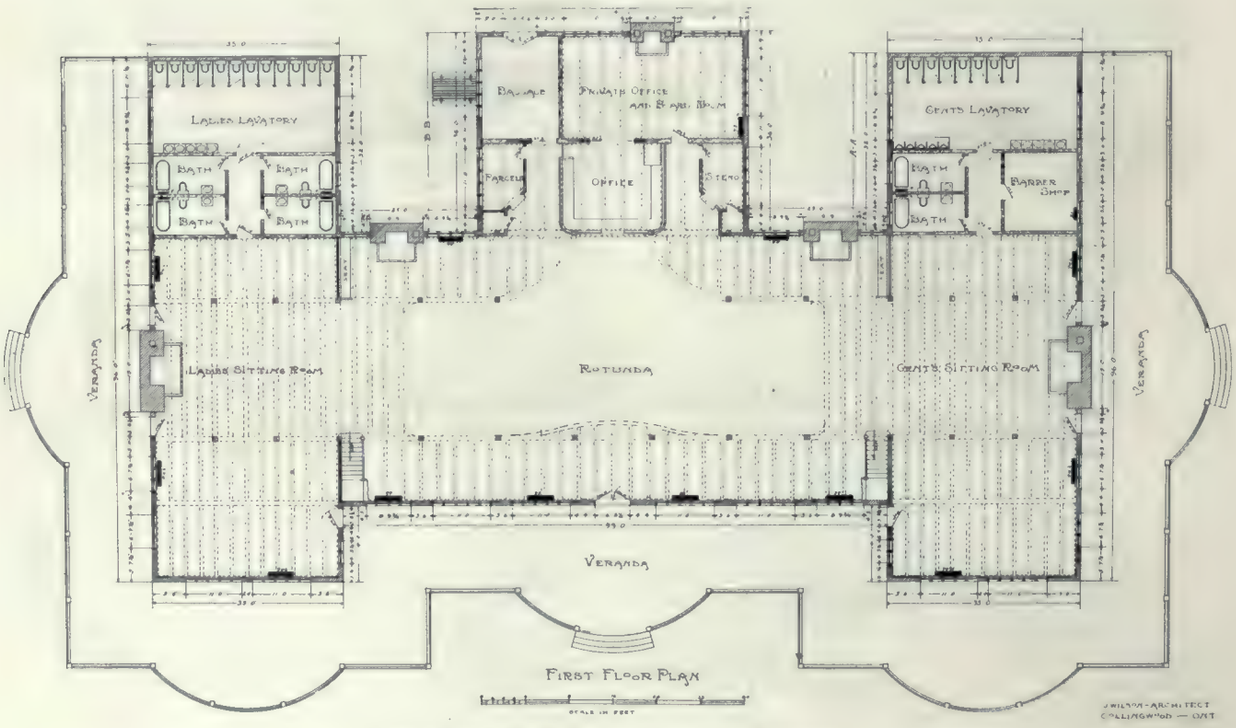
ADMINISTRATION BUILDING: VIEW ALONG VERANDAH.

The Administration Building is a one-storey structure, 216x147 feet, of bungalow design, and forms the central feature of the group. It is surrounded on three sides by a veranda, 16 feet in width and increased to 25 feet at the five bal-

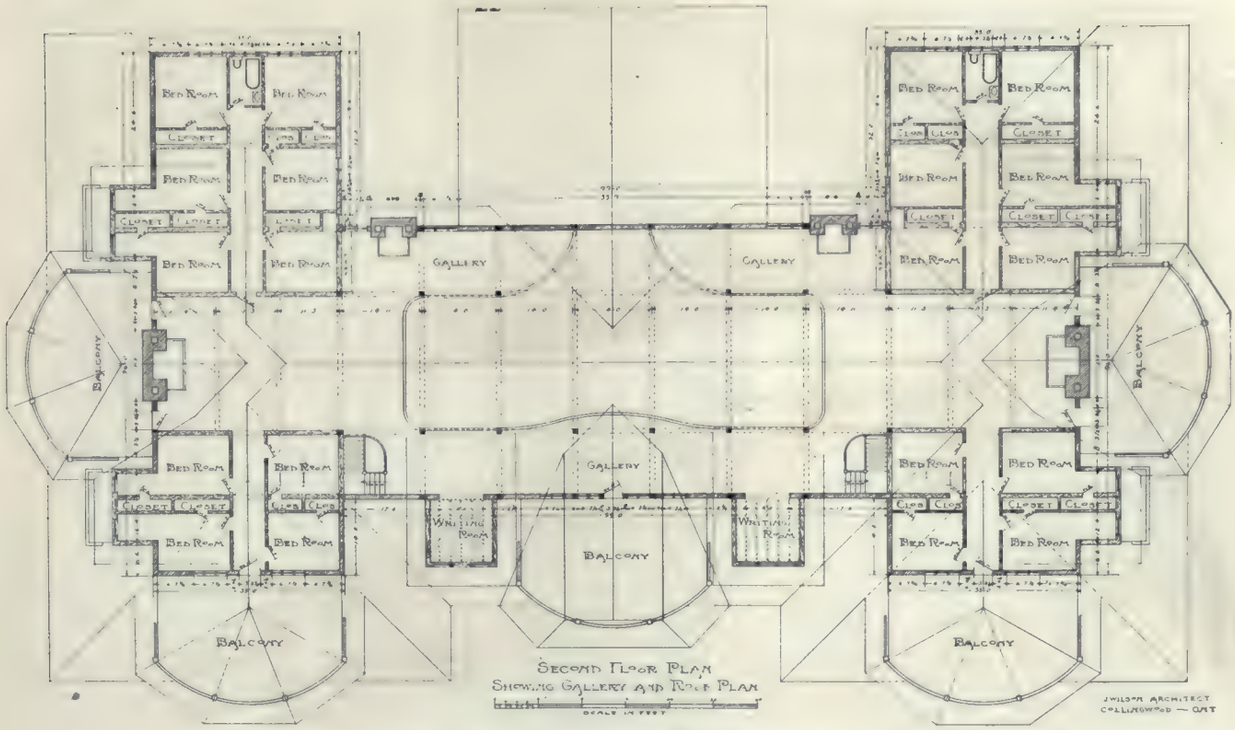
ADMINISTRATION BUILDING: VIEW SHOWING STONE VERANDAH SEAT.

cony points opening from the mezzanine floor. In it are the hotel and manager's offices, together with a large rotunda, lounge and sitting rooms, all forming one immense interior admirably suited for social purposes and indoor recreation. The decorative scheme is of a simple domestic character with beamed ceiling and exposed roof trusses in Georgia pine, stained with a wood preservative, and having wall board panels between the beams. The lower walls are finished in imitation leather on a burlap base. The floors are of polished hardwood with richly colored rugs, and the scheme is enhanced by community tables and benches, and comfortable wicker chairs and upholstered furniture. Here is found every hotel convenience, including parcel and checking rooms, local and long distance phone service, stenographer's desk, barber shop and manicuring parlors. On the mezzanine are card rooms, writing alcoves and reading quarters. One of the most attractive features of the whole scheme are the nine fireplaces which are equipped with old-fashioned cranes, pots and ovens. These fireplaces are constructed of native stone from the site, and are planned for the pleasure and comfort of the guests, and have large openings, which in some cases are capable of taking a six foot log.

Comfort and a real homelike atmosphere is the predominating note which runs throughout the several structures. While designed as separate units, the various buildings form an in-



GROUND FLOOR PLAN OF ADMINISTRATION BUILDING.



SECOND FLOOR PLAN OF ADMINISTRATION BUILDING.

tegral development by being connected with each other by covered walks allowing the maximum of circulation even in inclement weather.

The Dining Hall is a huge building in Venetian design, 144x240 feet, situated at the water front, and has a seating capacity sufficient to allow of every guest in the hotel dining at one time, thus obviating the necessity of arranging for two or three sittings at the meal hour. In addition to this, there is a separate children's dining room in charge of a nurse and special attendants, and a rathskeller or grill room at the lower level for guests who prefer an a la carte service.

The main dining room is dodecogan, or twelve-side in plan, presenting a spacious interior with a 22 foot ceiling, three fireplaces and an orchestra gallery. It is entirely free from any obstruction with the exception of one supporting column at the centre. The walls are finished with burlap panels, with brown stained battens, tinted above, and pierced with a double row of windows extending around the entire room and overlooking the encircling promenade or balcony. The lighting fixtures are of the semi-direct type, consisting of suspended ceiling bowls, with colored wall lights or medallions of Chief Bigwin on each pilaster, forming a unique decorative touch.

The entire service department is in every regard developed along well-organized lines.

VIEW OF MEZZANINE, ADMINISTRATION BUILDING.

ROTUNDA OF ADMINISTRATION BUILDING, BIGWIN INN, LAKE OF BAYS DISTRICT, ONTARIO.

Adjoining the dining room is a large serving pantry, 42 x 40 feet, and immediately beyond this is the kitchen, 70 feet square, together with stock refrigerator, butcher shop and stock-room facilities. The equipment here is of the most modern type, consisting of steam tables, tray racks, dish warmers, cream whipping and cream freezing machinery, and working sinks. There is also a sponge-proof room for the bakery and dough mixer, as well as lavatories and shower baths for the staff. Underneath the kitchen is the bakery proper, equipped with two standard bake ovens and tubular boiler for cooking and heating purposes, together with reserve stock refrigerators and additional store-rooms.

The East and West Lodges are located directly behind the Administration Building, and are placed in shady avenues of trees which form a quiet and restful atmosphere at all times. Each unit is 40 x 485 feet and contain 142 rooms with hot and cold running water. Between every pair of rooms on the two main floors is a bathroom, in addition to the several public baths located at convenient points. An unusual point of interest lies in the fact that these buildings are concrete structures, even to the partitions and dividing walls between the various rooms, the domestic character of the design being emphasized by half-timber work. All floors are of hardwood, while the interior trim consists of Georgia pine with three-foot burlap dado finished to represent leather, the upper portion of the walls being plaster on metal lath and tinted.

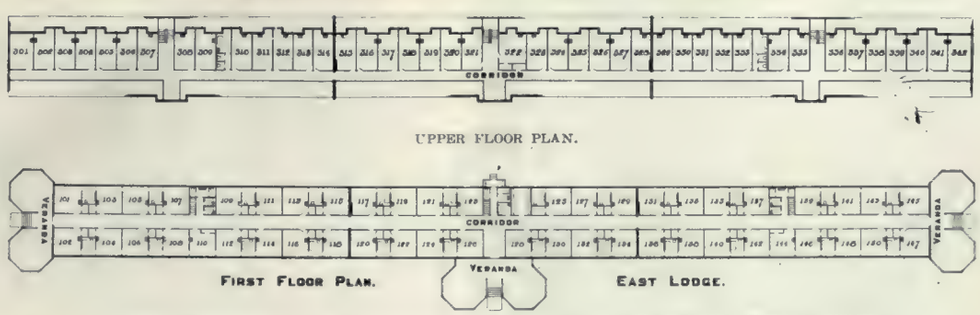
A dancing pavilion and boat-house complete the main group. The dancing floor is 120 feet across and provides dancing accommodation for two hundred and fifty couples at one time. A feature of the plan is a 16-foot mezzanine overlooking the dancing space and providing a delightful place for rest intervals. Underneath are mooring slips for motor boats, providing space in all for some thirty pleasure craft.

An interesting part of the general scheme is the observation tower. It is situated at some distance to the rear, and affords a delightful view of the hotel and the surrounding country from an elevation of 300 feet.

The hotel has its own power plant and sewerage disposal grounds. In arranging for heating, lighting and sanitation, the very greatest of care has been taken to provide systems of the most approved type. The water supply is of the purest. The power-house has a duplicate

VIEW OF EAST LODGE.

BIGWIN INN, LAKE OF BAYS DISTRICT, ONTARIO.



TYPICAL ARRANGEMENT OF FIRST AND SECOND FLOOR OF THE "EAST" AND "WEST" LODGES.

plant to guard against any breakdown. There is a steam heating plant for cool nights. A most complete laundry is owned and operated by the hotel company, the very best of laundry service being available for the guests. Moreover, the company owns its own dairy farm overlooking the Muskoka River. A herd of fifty cows is maintained to supply the purest of milk, cream and butter, while vegetables for the table are also grown here.

The help is housed in a separate structure of bungalow type, placed apart in the main buildings, where every effort has been made to provide homelike and comfortable quarters. This building is also fireproof in character and is equipped with the facilities and conveniences to be found elsewhere.

From every viewpoint the unity of the scheme has been well worked out. Credit is due the designer for his successful adaptation of the buildings to the natural features of the site. The Inn leaves nothing in the way of conveniences or comfort to be desired on the part of the guest, and is reminiscent to a great extent of some of the more famed European watering resorts. There is only this difference, namely, that nature here in Canada has furnished a setting which cannot be surpassed in any other country. It is only one of the many delightful spots which could be developed on somewhat similar lines, and should furnish an impetus towards developing a higher standard of summer hotels in the lake districts.

At Bigwin the climatic conditions are ideal; the district is situated at an altitude of more than a thousand feet above the sea level,

JOHN WILSON,
ARCHITECT.

DINING HALL.
BIGWIN INN,
LAKE OF BAYS
DISTRICT.

RATHSKELLER OR GRILL ROOM.

EXTERIOR VIEW.

DANCING FLOOR OF PAVILLION.

DANCING PAVILLION AND BOAT LIVERY.

the air being invigorating and pure. The island is heavily wooded with maple, beech, birch, oak, ash and other varieties of immense height and wide-spreading branches. There is, indeed, nothing lacking or missing, either in the scenery surrounding or in the accommodations provided to mar the composition, but a magnificent development which anticipates every requirement which the summer sojourner might seek.

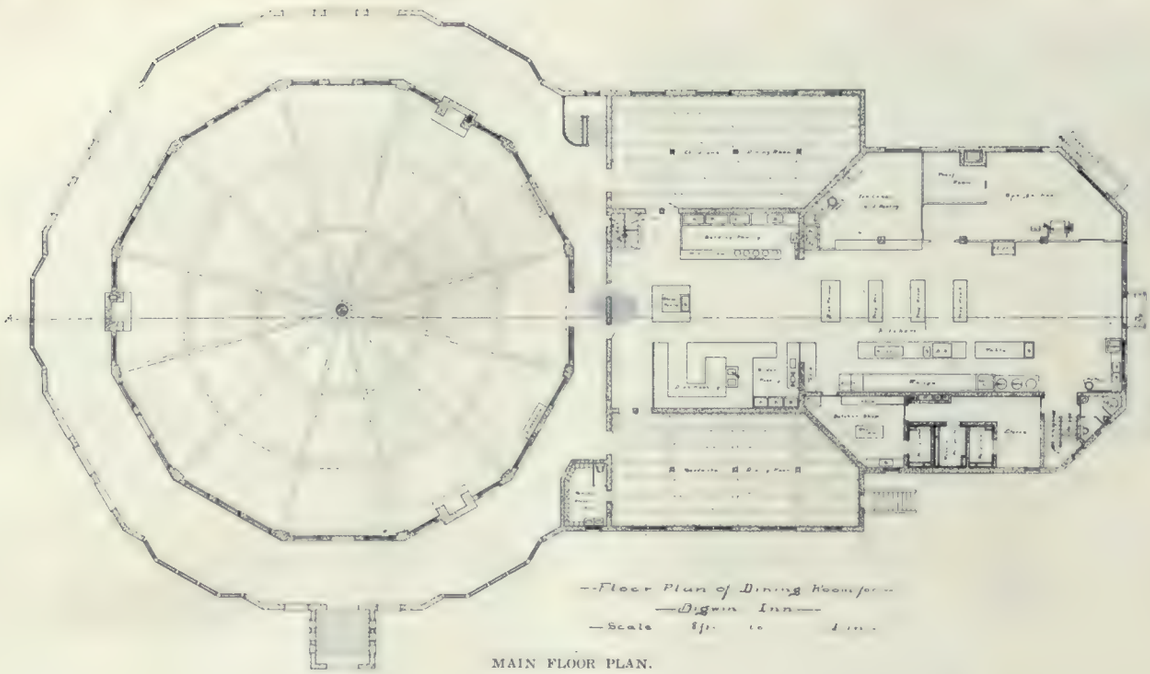
Growing New Forests

Citizens who read of the inroads of fire and the amount of cutting in Canadian forests frequently inquire anxiously of forests what the different government forestry departments are doing in the way of planting trees. This anxiety is a very healthy sign and shows the progress Canada is making in forest conservation, but at the present time the question is not so important as this one: "What are we doing to protect our forests?" This is not begging the first question, for a forest is not a dead thing like a quarry or a mine, but a living thing more akin to a flock of sheep. If the flock is protected, it increases in numbers, and if the forest is protected it grows new crops of trees on the burned-over lands and replaces the trees cut for lumber. Lumbermen take the mature trees, but fire takes mature trees, saplings, seedlings, and even the soil in which the trees grow. In a country with such great areas of forest land and with such a climate as Canada, nature will grow new forests rapidly if only given a chance. But even if it were not so and planting were an absolute necessity to preserve Canadian forests, what would be the good of planting if our fire protectionu were so poor that we allowed these seedlings to be burned up a year after they were planted? Planting both in Europe and Canada is necessary in certain cases, but it cannot be undertaken until there is reasonable assurance (as there is in the settled districts of the older provinces) that these plantings will be protected from fire. The first duty of Canadians is to protect their mature timber and their young forests from fire.

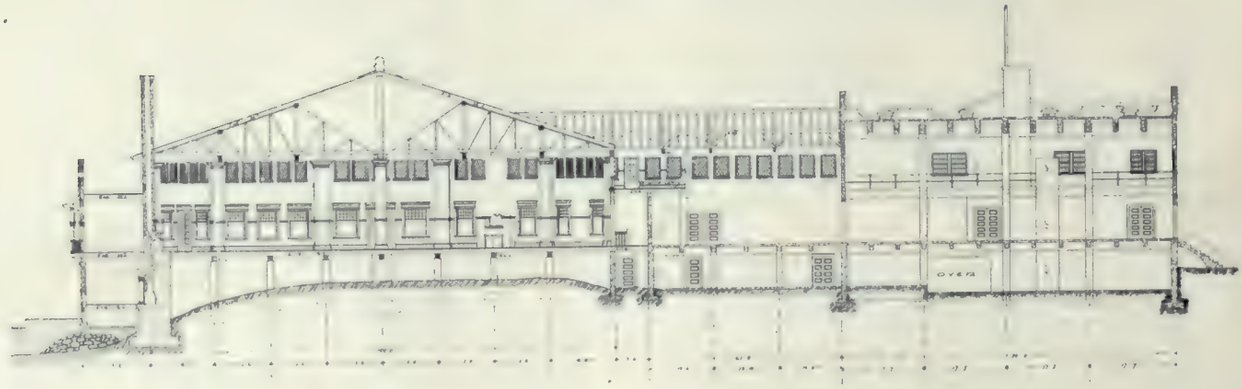
Canadian Woods for Structural Timbers

When Canada produces a good article at home there is no patriotism or wisdom in getting an inferior article from abroad at no saving in price. This is what has been going on to some extent in importing structural timber in past years. This subject is dealt with in Dominion Forestry Branch Bulletin No. 59, "Canadian Woods for Structural Timbers." This bulletin was prepared at the Forest Products Laboratories of Canada, established by the Department of the Interior to investigate the properties of Canadian woods. The bulletin deals with all Canadian woods used for structural purposes, and compares them with the woods most commonly imported, and shows how Canada's chief structural timber excels in quality that imported. The bulletin may be had free upon application to the Director of Forestry, Ottawa.

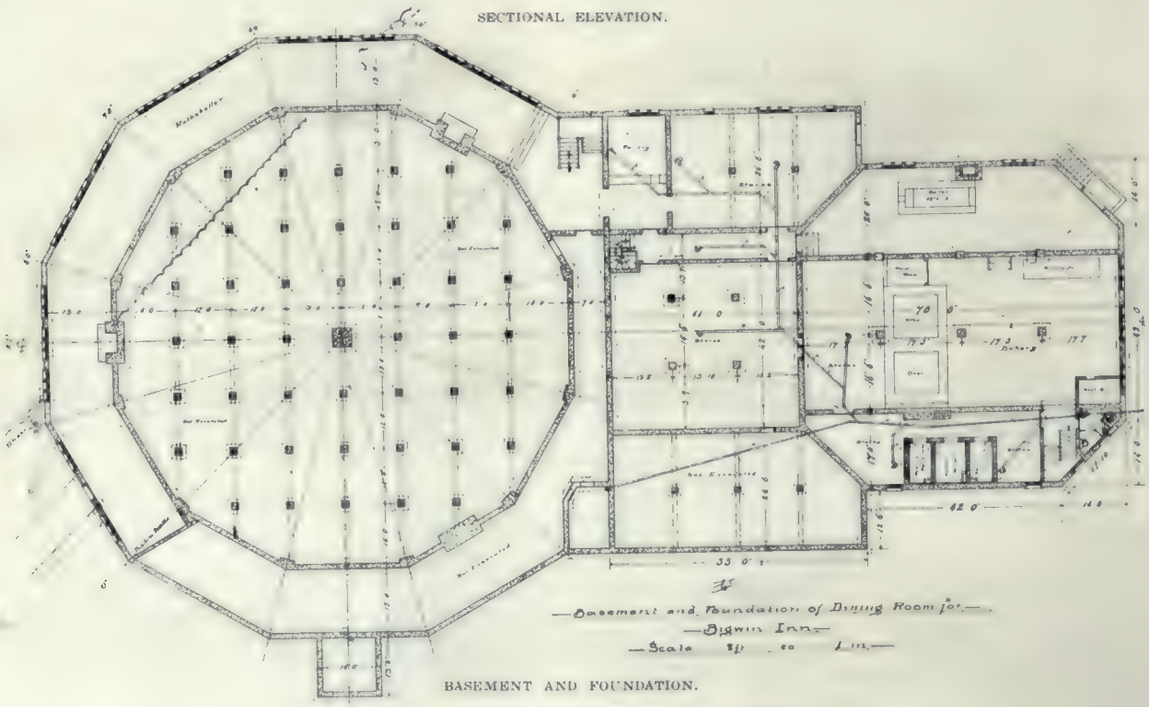
VIEW FROM DINING HALL BALCONY.



MAIN FLOOR PLAN.



SECTIONAL ELEVATION.



BASEMENT AND FOUNDATION.

DINING HALL, BIGWIN INN, LAKE OF BAYS DISTRICT.

Monumental Architecture and Town Planning

Address delivered at the recent Exhibition of the Toronto Chapter of the Ontario Association of Architects.

We have been reading in the daily press for over two years of proposed memorials to the honored dead who fell in the Great War, and it must have struck us many times that there is abroad in the land a very erroneous idea as to just what a memorial should be. On the one hand we have those who consider that the proper kind of a memorial is the purely utilitarian type, that something useful should be erected, not something beautiful or suggestive—a skating rink or an hospital, not a memorial arch or a monument. This idea seems to me to be quite wrong.

If the utilitarian idea is adopted we miss the very essence of the memorial idea, namely, that the structure should be distinctively commemorative and suggestive in the character of its design. That it should be a work of art, beautifully designed and executed is only too apparent. It should be the finest product of the designer's art, built with painstaking and sympathetic care from the foundations to the crowning stone, a structure that would strike the imagination and point the path of duty to generations still unborn, that the youth of our city should be reminded of the sacrifices that have been made in the past so that they might walk abroad in peace and freedom.

If the skating rink is erected it soon loses its identity as a memorial and becomes merely a building. We must not forget that many of the things that our race love, cherish and take just pride in, are not what might be strictly called useful. The works of Shakespeare and Dickens, the paintings of Sir Joshua Reynolds and Turner, the carving of Grinling Gibbons, the monumental architecture of Inigo Jones and Sir Christopher Wren, the cathedrals of England, these are the heritage of the British and have helped to mould and form the soul of the people.

We have yet to learn that Toronto is going to honor herself in erecting a splendid memorial to her dead. Is it not high time that a committee of leading citizens should be convened to discuss such a monument, and should we not feel somewhat ashamed that such action has been so long delayed? And in this connection might I make a suggestion that on this commission there should be at least one architect?

We have lately had two housing commissions appointed and not an architect on either of them. Surely the architect's training and experience should have pre-eminently fitted him for such a position. This overlooking of our profession we have become accustomed to in Canada. While we are still a young country, we need not necessarily be a crude one, and I would like to make this public protest against the many slights that we as a profession in Canada have to contend with.

If the idea of a beautiful and monumental city does not appeal to the imagination of our citizens, perhaps it might appeal to them when considered from the "cash" point of view. The merchants of Toronto should be directly and vitally interested in beautifying Toronto, not only by erecting fine buildings and monuments, but by the opening up of squares, and new streets and parks, because it means money in their pockets, tourist money, money made elsewhere and spent in Toronto. The Yonge Street merchant knows that it pays to dress his window; he has to do it if he wants to sell his goods. Are not the parks, public monuments, fine buildings, simply window dressing on a big scale—dressing the town instead of the window?

Consider for a moment the vast sums of money that are spent by tourists in Paris, London and Washington. There is no good reason why we in Toronto should not have a very large tourist traffic, vastly greater than at present. We must, however, have good roads and a beautiful city to attract the tourist.

Examined from the purely selfish point of view, that of self-interest, it is important that the different merchants' associations should support rather than hinder some of the schemes which are now under contemplation—such as the widening of upper Yonge Street and the extension of Church Street and Terauley Street through to Yonge Street.

The opening up of a short avenue from Queen Street to the new Union Station midway between Bay and York Streets also represents a much needed improvement. In this connection we must remember that the modern railway station is really the big entrance gate to the city, and as first impressions are lasting, it is important to have a fine approach to the station. Long blocks are very bad for business, and if this improvement were carried out there would be a very great increase in land values on all property east and west of this new avenue.

If a semi-circle of land was taken just in front of the station, space would be afforded for a fine triumphal memorial arch, which should make an effective entrance motif to our city.

EXAMPLES OF MUNICIPALLY AUTHORIZED UGLINESS

Before passing to the second part of this address, I would like to call your attention to

two very glaring examples of municipally authorized ugliness, namely, the use of projecting overhead signs, and the overhead wires and poles that line our streets. These two eyesores do more to cheapen the appearance of Toronto streets than any dozen others. If you walk down Yonge Street you can hardly see the buildings for signs, poles and wires. There are so many of them that they defeat their own object.

This idea of a projecting sign is simply the old tradition of the country village, or the mining town, and has no place in a metropolitan city. They should be done away with. Toronto should not be called the "Queen City," but rather "Pole Town." Trolley poles, hydro poles, telephone and telegraph poles, transformer boxes, power lines, literally obscure the sky and disfigure our streets; there are some corners which resemble the barbed wire entanglements of the Huns. These overhead wires should be put underground in the down-town sections and between blocks in the residential areas.

There is another important civic improvement which should not be too long delayed, namely, the widening of Bloor Street, and its extension easterly through to Kingston Road, and its extension westerly by a high level viaduct over the Humber, through to Dundas Street, just beyond Islington.

The fastest-growing section of Toronto is the Danforth; the viaduct and the width of Danforth Avenue have much to do with this development. Danforth is the proper width—wide enough between the car tracks and the curb for a fast moving vehicle to pass a slow one without any loss of time. There is a great economy in this time saving, for time is money, and the blocking of traffic paralyzes trade and means an increase in overhead expenditures, which the public is called upon to bear.

If Bloor Street was thus improved it would become the great thoroughfare of Toronto, which its geographical position warrants. It is rapidly becoming that now, serving, as it does, a large contiguous territory, including Rosedale and territory north to the Hill. Consider the traffic at the corner of Broadview and Danforth, Yonge and Bloor, Avenue Road and Bloor; this congestion is simply the forerunner of what is going to take place in the future.

Every merchant in Bloor Street should therefore be vitally interested in the widening of the older sections of Bloor Street, because it means increased circulation, greater traffic, greater business and more permanent real estate values for his property.

Let us turn from the monumental side of architecture to the more intimate side — the decoration of the home. Now, it is quite possible that a house may be well designed, well built and equipped with the best of heating and plumbing appliances, but decorated and furnished in the most atrocious taste. This may not seem a very important matter in the opinion of many, but entirely aside from the joy of living amid beautiful surroundings and of giving your friends pleasure, it has often a very direct influence on the health, spirits and happiness of the occupants.

Take, for instance, the question of color and wall paper decoration. The person who lives in a room, no matter how small, with red wall paper, especially if it has a pronounced pattern, is bound to grow irritable. His eye is unconsciously doing it for him. On the contrary, if he lived in a room of softer tones—greyed down—he would rapidly recover and the family benefit in consequence.

There is a common idea abroad that good decoration costs a great deal of money, but it is quite the contrary. It is no more expensive for a client to have a well designed and decorated building than a poor one. It is purely a matter of taste, and here is where the professional architect meets with one of his greatest difficulties.

I have never met a man who admitted he had bad taste. On the other hand, I have met thousands who knew all about architecture, decoration and furniture, and were quite competent, in their own opinion, to criticize the houses and rooms of their friends, and the work of the architect. Our profession would only ask the lay man and woman to remember, when offering criticism, that the architect is not turned loose on a building, but is simply trying to carry out his client's wishes, and, in many cases, trying to prevent him or her from making serious and costly mistakes.

Please remember, also, that while the building is for the client, the architect's reputation is also tied up with it, and be charitable when a division of opinion arises.

The treatment of walls in interior decoration is of great importance. There are two general ways of treating wall surfaces. First, by the use of decorated patterns, stencilled on the wall, by the use of wood panelling, or by the adoption of a pronounced pattern in a wall paper treatment. Second, by the use of plain tone wall papers or by the tinting or painting of the walls in plain tones. For certain rooms it is often desirable to use the first type, and much more often it is preferable to use the second. The great advantage of the plain toned walls is that it gives a good background for pictures, mirrors, etc., and is also a foil to the color in your rugs, curtains, pictures, chairs, etc.

If the first type is selected, great care must be taken especially in the selection of wall

papers, that the patterns are not too pronounced, that they are more what is customarily called all-over patterns.

In the selection of curtains, it is necessary to remember that if the wall treatment is in a tone, you can use either a similar tone, darker, or a figured pattern of a pronounced contrast. If, on the contrary, you have a patterned wall treatment, it would be safer to use a plain tone material, or an invisible pattern fabric.

The ceilings, generally speaking, should be a pure warm white, or just off the white in any tone that you are aiming at in your decorative scheme. It is a very good plan to put decorator's cotton on the ceilings. It prevents many cracks and gives a good surface to work on. Flat tones rather than oily or shiny ones are preferable in the treatment of walls and ceilings. This, of course, does not apply so strictly to the treatment of bath rooms and kitchens.

In the selection of wood for trim, doors, etc., there is a fair latitude. If the wood is to have a painted finish there is a choice of colors, such as warm white, light ivory, old ivory, dove grey, French grey, ebony black, the use of which would depend on the color scheme you propose to adopt for any individual room.

The Georgian or Colonial treatment of the modern dining room is to paint the trim white or light ivory and to have mahoganized birch doors.

Perhaps a word of warning as to the mahoganizing of birch doors would be in place. As the use of real mahogany is out of the question for the average home builder, it is the custom to make the doors of birch and to so treat them that they resemble mahogany. There are countless examples of mahoganized birch and other woods, which are a disgrace to the finishers' art. Unless this treatment is well done, it would be better to paint the birch or stain it some lighter color.

If one is contemplating the mahoganizing of birch, it is advisable to proceed as follows: Stain first with a dark brown stain, then overstain with a red stain, then varnish and rub down with pumice stone and water, then varnish again and rub down. Of course it will be necessary to allow a certain time between coats. By this method it is possible to get that old nutty brown quality which characterizes old mahogany in place of the light cherry effect.

In the hanging of pictures and the furnishing, beware of two things, first, the cluttering up of the walls with small pictures and photographs, hung at all possible irregular levels. Have fewer pictures or prints and larger ones, with some attempt at a general balance of levels. The different sizes and shapes of the pictures will give enough irregularity to take away any appearance of stiffness. Second, do not overcrowd a room with furniture. There is a happy medium between bareness and a room so full of chairs, tables and cushions that there is hardly room to move.

In conclusion, I would suggest that those who are interested in interior decoration should visit the Royal Ontario Museum, not once a year, but often. Under the able direction of Mr. Currelly, this museum is rapidly forging ahead into the first rank. There are many fine examples of faience, glass fabric, pottery, wood carving, iron work and furniture, a thorough study of which would amply reward the student.

A knowledge of interior decoration and of the different styles is a fascinating pursuit, even for the lay man who does not intend to use his knowledge in the professional way.

Prices on Brass Goods

Under the heading of "Our Common Problem," the "Mueller International News" in its last issue has an editorial dealing with the question of prices as regards water, plumbing and gas brass goods, from which the following is taken:

"Prices on brass goods have been adjusted without regard to the actual cost value in the hope that the regular channels through which these lines are distributed would recognize their responsibility to keep the wheels of industry turning. The present is the most opportune time to buy brass goods. Copper and other metals are quoted at lower prices than the prewar average. All authorities agree that the extreme low limit has been reached. Any revision will be upward which will force an advance in present prices. The jobbers and plumbing trade will be protecting their own interests by carrying stocks that will enable them to give exceptionally quick service.

"Reports from all centres indicate that more building is contemplated or in process than at any previous time, with the exception of a portion of the year 1920, since the war began. If buyers generally refuse to place orders until they require the goods a situation similar to that of last year, when it was almost impossible to secure delivery, will be created."

In conclusion, the editorial says that confidence in the wealth of Canada and in the initiative and courage of its people alone will complete the readjustment period with the least disturbance to the natural flow of business, and it advises the trade to keep both feet on the ground and to adopt a courageous commonsense policy in which optimism should be the dominant note.

GARAGE, SHERBROOKE, QUE.
PHILLIP J. TURNER, F.R.I.B.A., ARCHITECT.

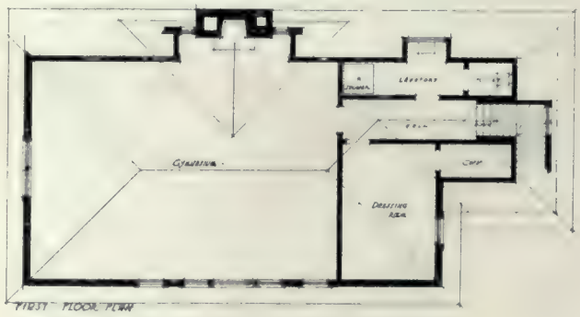
Garage, Sherbrooke, Que.

Situated on the edge of a bank, this garage has been designed for five cars. The garage itself is of fireproof construction, the floor being of cinder concrete, reinforced with steel beams.

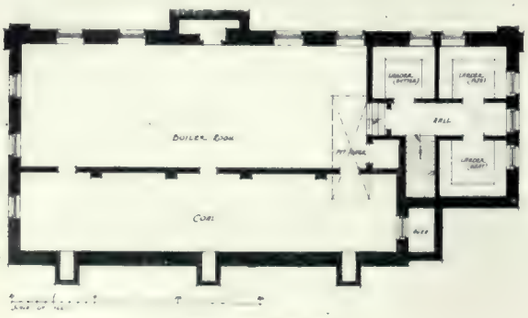
The basement is to be used as the boiler room for the house, the steam mains being carried underground. Special larder and refrigerator accommodation is also provided on this floor. On the upper floor, over the garage, are a gymnasium, 35′ 6″ x 25′ 6″, with fireplace and open roof, a large dressing room and lavatory.

A portion of the garage is divided off by a folding partition, so that any car can be washed without interfering with the other cars. A pit in the floor is also provided in this space, with a workshop and toilet adjoining.

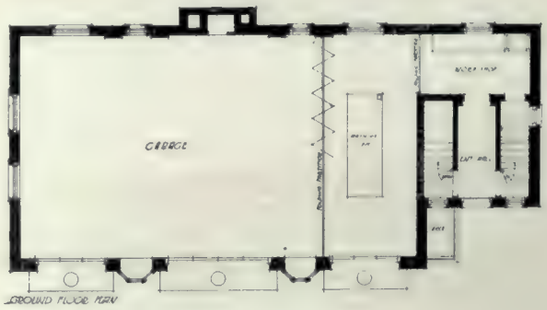
The inside of the garage is lined with white enameled glazed bricks, and the doors are made in folds and provided with patent door hangers.



UPPER FLOOR PLAN.



BASEMENT PLAN.



GROUND FLOOR PLAN.

Apprentices for the Building Industry

With a view to encouraging an efficient system of apprenticeship for the building industry, the National Joint Conference Board of the Building and Construction Industries, has submitted a plan to employers' associations and trade unions, which, in its main essentials, should be acceptable to the interested parties.

In putting forth the proposal, the Board admits that neglect of those actively engaged in the industry to provide education on technical lines, the intermittent nature of employment, the desire of employers to use boys during rush periods only, and the general lack of interest and sympathy between employer and employee with consequent loss of opportunity for a boy to acquire training essential to make him a good mechanic, have had a serious effect on the industry.

Not only is the matter one of vital importance, but it is declared that to bring about a condition which aims to fulfill the requirements of the industry, it is necessary to lay down new principles on a solid foundation. The Board fully realizes that many objections and difficulties will be met in attempting to solve the problem. Any plan, to be successful, it points out, will need the hearty co-operation of all who realize the seriousness of the problem and the necessity of providing a solution.

PERSONNEL OF COUNCIL

The Conference Board first recommends a National Apprenticeship Council, composed of an employer, a journeyman, two architects and two industrial engineers from each branch of the industry, who will set up local councils of a similar character. Indenture forms will be drawn up and boys apprenticed to employers shall be given every opportunity efficiently to learn their trade in the workshop, on the job and by attendance at a technical school for one-sixth of his time, without deduction of wages, which shall not be less than two half days a week. Apprentices shall also be bound to attend evening courses twice a week during school terms.

It is recommended that the local council shall arrange hours of labor, working conditions, rates of wages, and all other matters pertaining to the training of apprentices, and arrange with local educational authorities for classes for apprentices. An examination board of not fewer than three members shall be appointed by the council, and shall conduct, at stated periods, the examination for apprentices.

Governing Local Conditions

The local council will determine the number of apprentices necessary, and will make the necessary arrangement to transfer apprentices from one employer to another if it is thought the apprentice can better acquire special knowledge and experience in this way.

The proposed indenture form is to be signed by the parent or guardian of the apprentice, the apprentice, the employer and the Apprenticeship Council.

Anyone articled will not be permitted to join any society claiming to control his labor, except that after two years of his term he will be permitted to affiliate with a labor organization, and is permitted at any time to join the militia. The period of apprenticeship is four years.

Terms of Agreement

Under the terms of the covenant, the first party, who is the parent or guardian, agrees that if the apprentice at any time during the said term is dismissed "for want of good and faithful attention to his duties, or for divulging the secrets of his employer, or for his not readily and cheerfully obeying the commands of the employer, the foremen, or other superiors, or for any reason or justifiable cause whatsoever" on demand, to pay to the employer damages ranging from $25 to $100.

Wages are not fixed in the indenture, this being left to local councils, but it is recommended that increases shall be at the rate of $1 per week every three months.

The local Apprenticeship Council is to be permitted to retain $25 a year from the apprentice's wages as a guarantee of his good behaviour, and the maintenance of covenants. If the apprentice is dismissed, or deserts his employer, the wages retained shall be considered as part payment of damages incurred by the parent or guardian.

Colored Concrete Buildings

One of the drawbacks to ferro-concrete which is now being used so largely in building construction is the dull, monotonous grey tone of the cement. A British architect has thrown out a suggestion that pottery manufacturers should consider the possibilities of decorating the face of a concrete building as they decorate pots and other vessels. The ferro-concrete carcase, he points out, could thus be clothed in a garment of permanent and beautiful color, capable of great variety. Regular patterns could be used without fear, and indeed the whole structure might be covered with rich coloring like a Persian or Turkish carpet. There were also opportunities for modelling in relief. He held out this prospect as offering scope for the further development of the pottery industry.

STORE FRONT, LAURA SECORD CANDY COMPANY, DUNDAS STREET, TORONTO.
MOLESWORTH, WEST & SECORD, ARCHITECTS.

Contract Awarded for Big Windsor Hotel

The general contract for the Prince Edward Hotel at Windsor, Ont., has been awarded to P. H. Secord & Sons Construction Company, of Brantford and Toronto. The architects are Essenwein & Johnson and Watt & Blackwell, with A. H. McPhail, of Windsor, as associate architect. The details of construction have not as yet been announced, but it is assumed the building will be of structural steel with concrete floors. Mr. R. E. W. Hagarty will act as consulting structural engineer on the job, another of the United Hotel Company's chain of hotels of which Geo. H. O'Neil is general manager.

Power Progress in Canada

While the increase in power development in Canada in 1920 was substantial, in many portions of the Dominion new installations and developments have not yet caught up with the ever-increasing demand for hydro-electric energy. Increase in power development naturally accompanies expansion of industries. The pulp and paper industry has undoubtedly attracted the greatest attention during the past year, but a large number of smaller industries and the ever-increasing uses of electricity for power and domestic purposes, both in urban and rural communities, are important factors in the increasing power demand. While the total water-power installation of the Dominion at the commencement of 1920 was some 2,500,000 h.p., the ultimate capacity of undertakings, either completed during the past year or under actual construction, will increase this total by some 840,000 h.p. This figure includes the 500,000 h.p. Chippawa development of the Ontario Hydro-Electric Power Commission. Additional projects aggregating some 360,000 h.p. are also under consideration.

The Province of Ontario leads with some 650,000 h.p. in undertakings, which are either under construction or completed; Quebec shows 140,000 h.p.; the Maritime Provinces, 30,000 h.p.; Manitoba, 20,000 h.p.

Undertakings which are projected for the near future aggregate some 200,000 h.p. in Quebec; 15,000 h.p. in Ontario, and 20,000 h.p. in the Maritime Provinces, while one project alone in British Columbia involves some 125,000 h.p.—L. G. Denis in *Conservation.*

Bill to Register Builders in New York City

A bill just introduced in both houses of the New York State Legislature provides for registering builders in New York City, and prohibits the issuance of building permits to or the conduct of building work by any persons not duly registered. The purpose is to be accomplished by amending the charter of the city by the addition of a registration clause. Under this clause a building permit can be issued only to an architect, engineer, builder, contractor or other person duly registered in the office of the Bureau of Buildings as a person fully qualified to undertake or supervise the work of construction or alteration covered by the permit.

Machine-Made Reinforced Concrete Structures

By F. G. Engholm, A.M.I.C.E., A.M.I.M.E., Consulting Engineer, Toronto.

ALTHOUGH great improvements have been made in recent years in the equipment of buildings, little change has been made in what might be termed standard materials of construction, namely brick walls, timber floors, lath and plaster ceilings and interior partitions, etc.

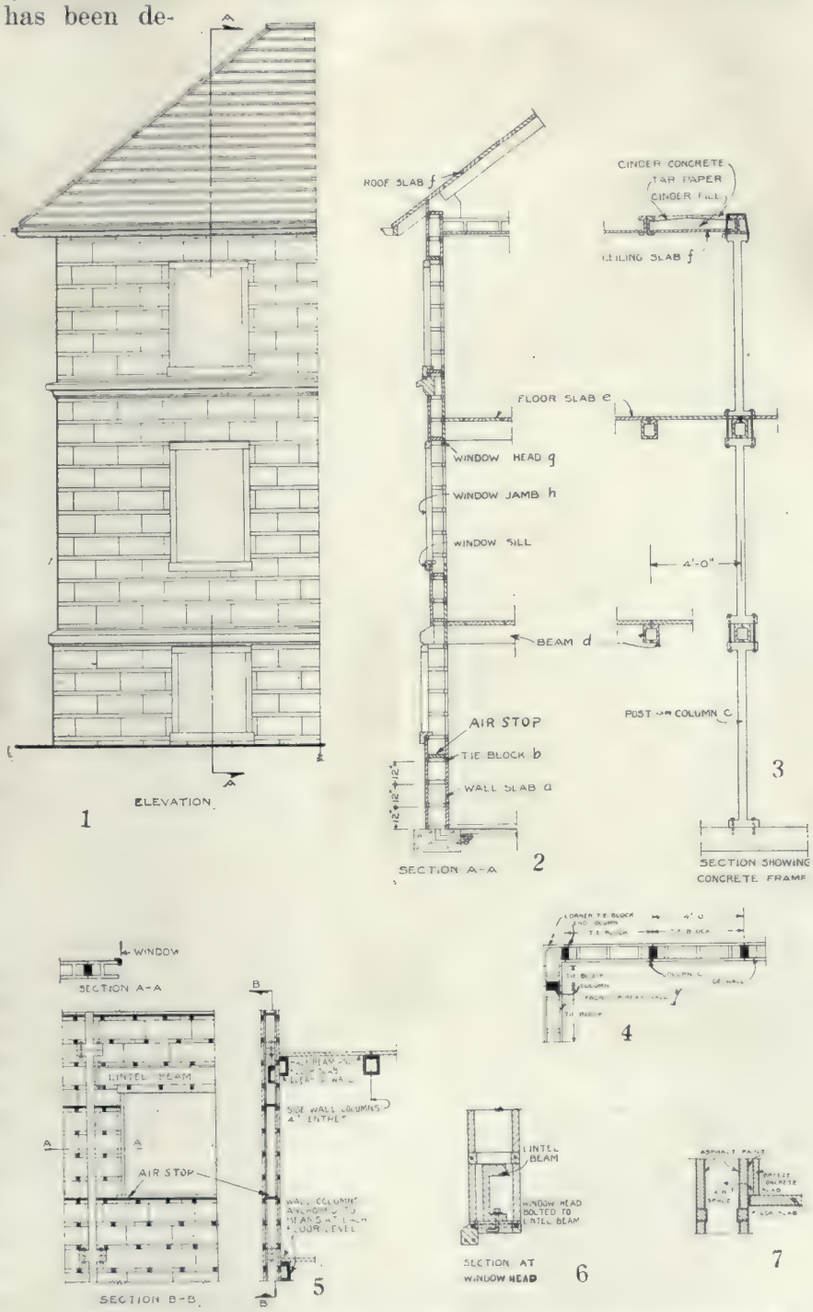
It is with the object of producing something better, which meets the true climatic conditions and public requirements, that the system of construction hereinafter described has been devised.

Very little attention has been given to the heat losses in buildings. Some building by-laws and building restrictions are careful to call for extra thickness of brick walls, presumably to obtain additional resistance to transmission of heat through the wall; yet they permit the ceiling and roof to be built out of three-quarters of an inch of lath and plaster for the ceiling and thin timber sheathing, a layer of roofing paper and shingles for the roof. There are many holes left between the roof and the lower part of the structure through which the air passes freely, so that the roofing only functions to keep the rain and sun off the ceiling, and all there is to resist the transmission of heat is the three-quarters of an inch of lath and plaster ceiling. The ceiling surely forms a very large proportion of the exterior surface of the building, and air passes freely through plaster. It is the custom of the country to endure the heat from the top floor of the building in summer and put more coal on the furnace in winter. It will, however, be evident that it is good business to pay more for the ceiling to have the same resistance to the transmission of heat, as a brick wall. These things are not apparent to the eye, but they are nevertheless significant.

Many attempts have been made to produce a form of construction, avoiding the use of timber and brick, which can be built for such price as to give equal or greater commercial advantage when compared with timber and brick construction.

Wood shrinks, warps, burns and decays.

Bricks are highly absorbent and are liable to disruption through the action of frost and temperature change, and are far from being airtight. Brickwork is weak in tension; care has to be taken in the design that no brickwork shall be subjected to tensile stress. Notwithstanding all care being taken to avoid such stress, any accident, such as uneven settlement of the struc-



DETAILS OF TYPICAL HOUSE CONSTRUCTION WITH MACHINE-MADE CONCRETE PARTS.

1—Part elevation of wall showing architectural treatment similar to cut natural stone.
2—Section through wall.
3—Section showing reinforced concrete frame.
4—Sectional plan of wall showing construction of corner of building.
5—Detail showing construction providing for large windows in front and rear walls.
6—Section through window head (see Fig. 5) showing lintel beam.
7—Section through wall, showing lining of inside of house with breeze-concrete slab.

ture, will disclose such weakness and cracks will occur.

Reinforced concrete as a material of construction possesses none of these undesirable characteristics. Regarding the reinforced concrete structure from this point of view, we begin to comprehend its true significance and value. However, to obtain full credit for these advantages, we have to avoid and overcome other difficulties, which, up to the present, have caused most serious obstruction to the progress and general adoption of reinforced concrete in place of brick and timber.

For instance, let us analyze the requirements of wall construction, apart from any architectural features, as follows:

Vertical Loading. A wall has to carry its own dead weight, plus the dead and live load from the floors and roof.

Lateral Pressure. A wall has to be strong enough to withstand a wind pressure of 30 lb. per sq. ft.

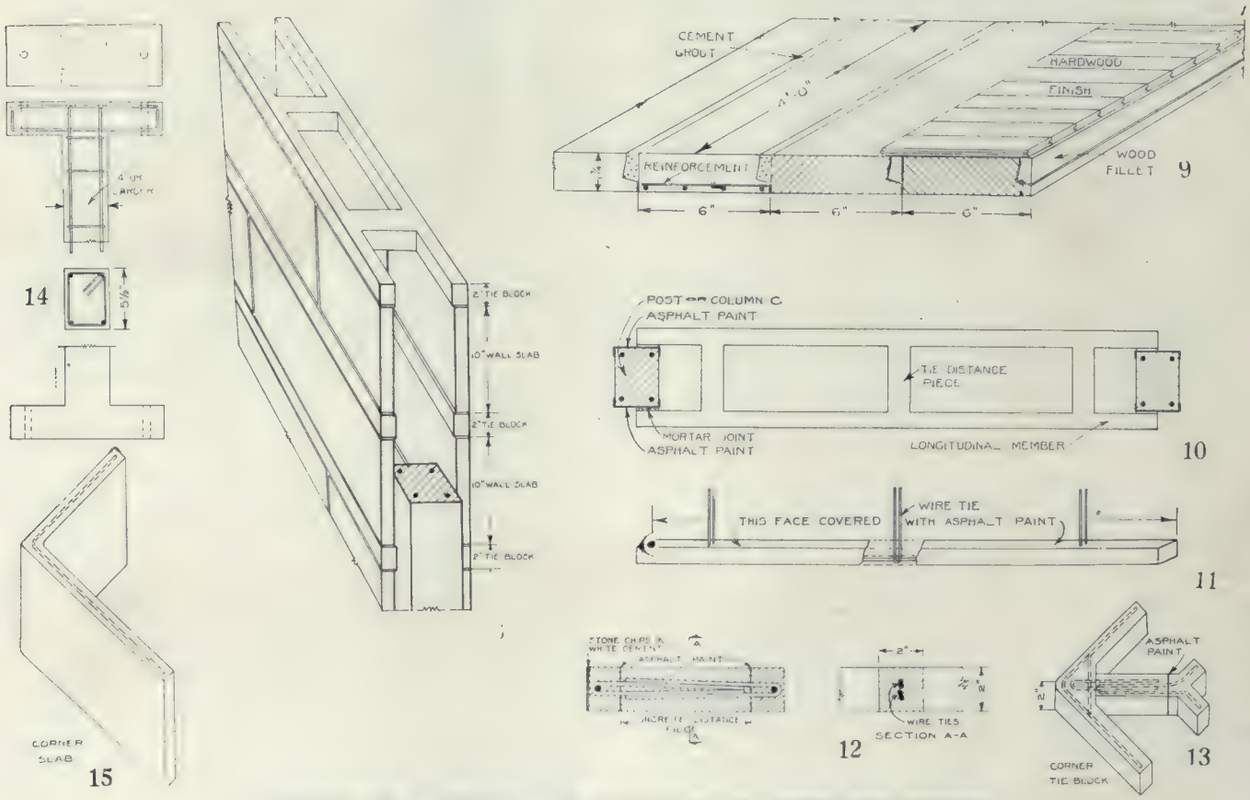
Weatherproofness. A wall must exclude all water and dampness from the interior of the building, and it must be reasonably air-tight. It must resist the transmission of heat, both from the interior of the house to the exterior, and from the exterior to the interior. Any construction should be equivalent in this respect to at least 9 in. of good brickwork, plus strapping lath and plaster.

COMPARING CONCRETE WITH BRICK.

Concrete walls applied to building construction have not been a success, because they are not air-tight and they have a less resistance to the transmission of heat than the brick wall.

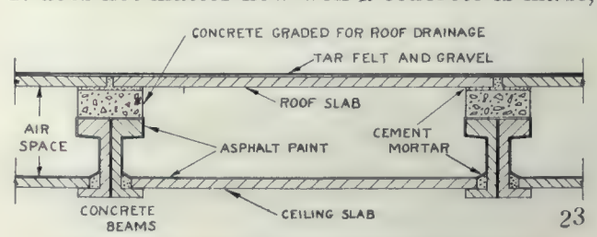
A standard 8-in. hollow concrete-block wall will transmit 50 per cent. more British thermal units of heat per one degree difference in temperature per hour per square foot of wall than a 9-in. brick wall. Further, the web member in the concrete block is solid with the interior and exterior face of the block, and serves to transmit frost and moisture through the block in low temperature and damp atmosphere. These difficulties can be overcome as follows:

(a) The high conductivity of concrete is partly due to the fact that concrete is not air-tight. It does not matter how well a concrete is made,



DETAILS OF MACHINE-MADE PARTS FOR CONCRETE STRUCTURES

8—Section through wall, showing wall slabs, tie blocks and wall columns.
9—Section through floor slabs.
10—Plan of tie block.
11—Detail of longitudinal member.
12—Sections through tie-distance piece.
13—Corner tie block (type of reinforcement indicated by dotted lines).
14—Detail of column, or post.
15—Corner or quoin slab (type of reinforcement indicated by dotted lines).



DETAIL OF ROOF AND CEILING CONSTRUCTION.

the strongest and most dense concrete made is not air-tight. Concrete pipe that will successfully withstand high water pressure will not sustain half a pound of air. If the surface of the concrete is covered with an asphalt paint or building paper, considerable difference will be noticed, as this material closes all the pores in the concrete.

A hollow concrete wall, composed of an exterior concrete slab 1¼ in. thick, 6½-in. air-space and an interior concrete slab 1¼ in. thick, having both concrete surfaces at the air-space coated with asphalt paint, has a resistance to transmission of heat considerably greater than a 9-in. brick wall.

Hollow tile has less resistance to transmission of heat than solid brick work so that the advantage over this construction will be still greater than over brick.

(b) If concrete wall constructions having any concrete web members solid with both the interior and exterior faces of the wall are avoided, the capillary action will be definitely stopped and satisfactory construction will result.

(c) Considering the vertical load and lateral pressure on a wall, if a wall is designed to depend on its mass for its stability in the same was as a masonry dam or gravity retaining wall, it will involve the use of a large quantity of materials at low stresses. If full advantage is taken of the properties of reinforced concrete to take tensile stress, as will be later shown, a great saving in materials will result.

(d) If a concrete wall is made absolutely damp and frostproof and has a resistance to transmission of heat equal to 9 in. of brickwork, plus strapping lath and plaster, the strapping lath and rough coat plaster can be dispensed with. Putty coat can be applied directly to the concrete and considerable saving can be effected.

As indicated in part above, there are certain definite practical necessities in building construction that must be met. The faults and remedies are given.

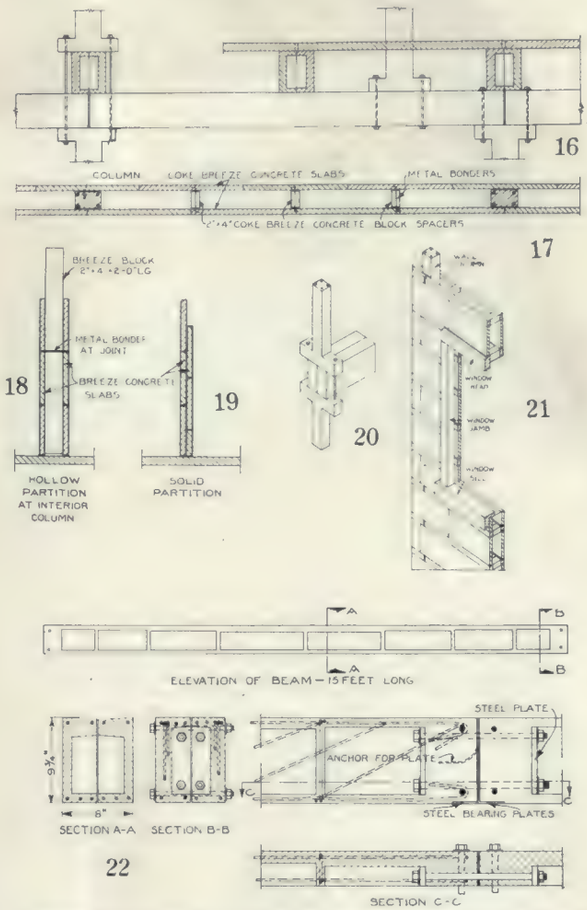
The system of reinforced concrete construction hereinafter described has overcome all these difficulties and has a "clean slate" to claim all the advantages that the properties of good reinforced concrete construction can give.

Good reinforced concrete is fire-resisting, vermin-proof, everlasting, and does not shrink to any appreciable extent after it has once properly set. Timber has none of these qualities, and never will have, but any system of reinforced concrete construction which does not comply with all the practical necessities will be doomed to failure or limited use under exceptional circumstances, notwithstanding these advantages.

In order to show the reasoning and the basis of this new system of construction the definite practical necessities and conclusions are discussed in detail under the following headings: (1) cost; (2) weatherproofness; (3) architectural appearance; (4) adaptability.

COST.

In order to present a rough perspective of the cost situation it will be necessary to make certain assumptions which may not be correct



ADDITIONAL DETAILS OF MACHINE-MADE CONCRETE PARTS.

16—Detail showing construction providing for wide column spacing and different alignment of columns.
17—Horizontal section through interior partition with columns.
18—Vertical section through hollow interior partitions, showing distance pieces.
19—Vertical section through solid partition.
20—Detail of column and beam connection.
21—Section through wall, showing exterior trim for window or door opening.
22—Details of beam. (Section C-C shows bolt connection for beams continuous over interior columns. Note steel bearing plates to distribute load over the concrete).

in detail, but they will apply satisfactorily in general principle.

Wall Construction. Consider bricks delivered on the job to be worth $15 to $20 per thousand —say, $17.50 per thousand, average, or 25c. per cu. ft., exclusive of labor and mortar. The average thickness of a house wall will be between 9 and 13½ in., and of an apartment house wall 13½ in. or more. We shall assume that the general average wall thickness will be 12 in., equivalent to 25c. per sq. ft. of area. Good concrete is worth about 50c. per cu. ft. at the mixer, so a concrete wall can only be one-half the thickness of a brick wall to cost the same in material, and to be the same in final cost we have to balance

FRONT AND REAR VIEWS OF PAIR OF HOUSES AT TORONTO, BUILT OF MACHINE-MADE CONCRETE PARTS.
A pair of semi-detached workmen's cottages built for experiment. The moulds used in manufacturing the concrete parts for this work were of a crude nature made to demonstrate the principle of manufacture only. The work is very rough compared with the results obtainable with proper equipment.

the cost of formwork, reinforcement (if any) and placing the concrete, against the cost of mortar and placing brick.

To give resistance to transmission of heat and moisture, the concrete wall will have to have an air-space. This calls for 4 sq. ft. of formwork per square foot of concrete wall. This formwork has to be stripped, cleaned and set for reuse, and the surfaces of the concrete have to be finished. If reinforcement is used, the steel rods have to be provided and set in place.

Up to the present time no scheme has yet been devised to cast in place high concrete walls with good surface finish, broken with window and door openings, to successfully compete in cost with brickwork. It is only by precasting or manufacturing concrete in sections, slabs or blocks that the cost can be reduced to compete successfully with brickwork.

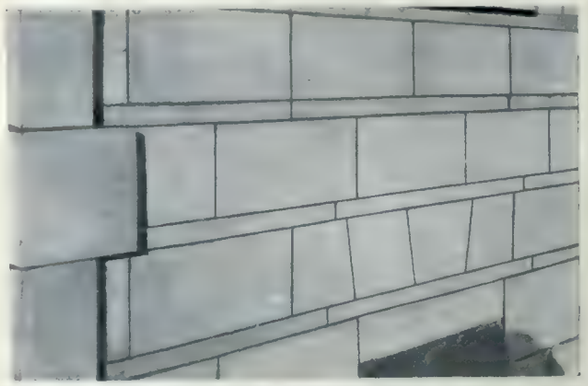
Although the weight of these sections is discussed later, it is as well to mention under this heading that the excessive weight of the sections customarily adopted increases the cost twofold, because the increase in the amount of material costs more, and the increase in weight of the product costs more for freight and to handle on the job. It will be evident, therefore, that the acme of efficiency lies in the direction of designing the lightest wall to give the required strength and weatherproofness.

In the system hereinafter described the average weight for a wall three stories in height, say 36 ft., carrying two floors and a roof, is approximately 31 lb. per ft. of wall area. This is about one-third the weight of 8-in. concrete block or of 9 in. of brickwork, not taking into account any increase of thickness due to height that may be required for these materials.

Surface finish is a costly item. Cast-in-place walls and walls built out of precast sections not having joints that can be architecturally treated must receive stucco or similar finish, which adds to the cost.

To reduce the cost, full advantage should be taken that the surfaces of the manufactured parts will require no further treatment after being built into place; also the strapping, lath and plaster on the inside face should be eliminated.

Floors. It is an exceedingly difficult thing to compete in cost with timber for floor construction. Unless a cement finish is required, the reinforced concrete can only take the place of the rough carpentry work, which leaves but small margin. The saving factor in the situa-



DETAIL OF WALL CONSTRUCTION.

tion is to eliminate the lath and rough plaster, applying putty coat or other finish direct to the concrete. This will mean showing the beams in the ceiling.

The quantity of reinforced concrete required for a floor is about equal to the quantity of timber. If the cost of timber is, say, $60 per M, equal to 72c. per cu. ft., as compared with 50c. per cu. ft. for concrete, there will be some saving in favor of concrete, but this advantage will be taken up in the extra cost of placing.

Timber floors are cheap to erect because timber is one-third the weight of concrete, and nailing is a quick and cheap method of securing the pieces in place. No scheme has yet been devised to reduce the cost of formwork and placing the concrete so that "cast-in-place" concrete can compete in cost with timber flooring. The long wait for the concrete to harden is a great handicap.

As in the case of wall construction, it is only by precasting or manufacturing the concrete into slabs and beams at a central plant, and building them into place on site, that the cost can be reduced to compare favorably with timber construction. The quantity of concrete should not exceed 2¼ cubic feet per square yard of floor for a 12 to 14-ft. span.

WEATHERPROOFNESS.

Weatherproofness has been discussed above under the heading of "Requirements for Wall Construction." For a concrete wall to be frost and damp proof, there must be an air-space in the wall, and there must be no concrete web members solid with both the concrete on the interior and exterior faces of the walls. To give the necessary resistance to transmission of heat through the wall, the surface of the concrete must be treated with asphalt paint, a layer of building paper or some substance to destroy the comparatively high conductivity of the concrete.

ARCHITECTURAL APPEARANCE.

It has always been an exceedingly difficult matter to treat concrete architecturally in buildings. Providing for contraction in cast-in-place work is difficult, and cracks on a plain surface are most unsightly. Concrete must always look like stone because it is stone, but it is not quarried, so it should never be made to imitate a rock-faced quarried stone.

Concrete slabs cast between polished steel plates have the color, appearance and weathering qualities of cut Indiana limestone. Concrete slabs cast in the same way but faced with stone chips and white cement have a flat, rough surface, as the stone chips are clear of cement. The weathering qualities of this surface is equal to natural stone. Buildings can be built out of both the rough and the smooth-faced slabs, with joints and all ornamental work in concrete, treated architecturally in the same way as natural stone. The surfaces are entirely free from crazing, and have permanently all the life and beauty of natural stone.

Stucco or rubbed finish, bush hammering, acid washing or pebble-dash finish are not finishes that will compare with natural stone in weathering qualities, as do concrete slabs cast between polished steel plates.

There can be no doubt that buildings of natural stone are most dignified. They create that impression of substantial well-being and comfort that is so eminently satisfactory. All this is true of buildings built from concrete slabs described, which can be obtained at less cost than brick.

ADAPTABILITY.

Timber as it comes from the sawmill is an article manufactured to standard cross-section dimensions, and can be readily cut to length at the mill or on the job. Brick similarly is an article manufactured to a standard size, small and easily cut.

Both these materials can be easily handled and built into place by the crudest methods and give results. However rough and undesirable these results may be, they will be far removed from the danger of collapse. The surfaces of the materials are finished and have an exterior appearance pleasing to the eye. In short, they are adaptable in every way to building construction, and call for the simplest manipulation to build into place.

Concrete cast in place is "manufactured" on site. To get the best results out of concrete the grading of the aggregates, mixing, placing and curing requires expert supervision and care, although the labor required for these operations is crude enough. Carrying out a manufacture in the field in small quantities, such as required for house construction, is different to building manufactured articles, such as brick and timber, into place.

Concrete cast in place is not adaptable to house work. Much can be done with standard formwork, but it is only under exceptional circumstances and conditions that it is possible to compete in cost with timber and brick. There is always the problem of creating a new trade of house-building in concrete, and the training of new workmen in competition with expert workmen of an established trade.

It is possible to precast or manufacture concrete parts in a central plant, from selected materials, under expert supervision and control, and give the best results. These concrete parts will compare with the manufactured articles, timber and brick, and can be just as adaptable to building construction to handle and build in place. They can be made of the highest quality concrete and reliable in every way.

In weight per cubic foot concrete is similar to brick, but it is three times the weight of timber. It is of paramount importance that the weight, size and shape of the concrete parts adopted should be such that they are easily handled and not liable to damage on account of their own weight being excessive. They must be adaptable to be a success. One must be able to build readily a house of any size or shape from the parts, and they must require only the simplest manipulation in construction.

The present system described herewith, which has been designed and patented by the writer, consists of a number of standard reinforced concrete building units which are manufactured at a central plant. They can be made of the best materials available and produced under best conditions for curing and finishing that will give a definitely reliable product of the highest quality. The parts are as follows (see Figs. 2, 3 and 4):

(a) Wall slab for exterior walls and interior partitions; (b) tie block; (c) post or column; (d) beam; (e) floor slab; (f) roof and ceiling slab; (g) window and door head; (h) window and door jamb; (i) window or door sill; (j) corner of quoin slab.

METHOD OF BUILDING.

A reinforced concrete frame is erected, consisting of columns or posts and beams spanning between them, 4 ft. on centres (see Figs. 2, 3 and 4), the odd lengths being made up in the end bays. The interior columns are arranged if possible to come within the partitions (see Fig. 17), and the exterior columns are enclosed by the outer walls, which are then built up (see Figs. 4 and 8).

The wall construction consists of an inner and outer wall of concrete slabs with 6½-in. or more air space between them. The slabs are laid in horizontal rows alternating with tie blocks so that a 9¾-in. wall slab plus a 2-in. tie block and two ⅛-in. joints make one course of work 12 in. high (see Figs. 2 and 8).

The tie blocks (Fig. 10) are really small concrete trusses, 4 ft. long, spanning horizontally between the columns and supporting the wall slabs against lateral pressure in the same way as a beam carries a floor slab. The ends of the tie block (see Fig. 10) straddle the columns, which take the load through a mortar joint.

The columns are fixed at each floor level (see Figs. 3 and 20) to the beams, and are made strong enough to withstand the lateral or wind pressure from the wall slabs plus the vertical load.

The floor slabs and ceiling and roof slabs are then bedded upon the beams and rafters, completing the main structure (see Figs. 2 and 3).

The interior partitions, carried at each floor level, are built with slabs made from coke-breeze concrete, two slabs thick, breaking joints (see Figs. 17, 18 and 19). The window and door openings are trimmed with concrete members, g, h and i (see Fig. 21), on the outside face, and the window or door frames are built the same as in brick construction.

The window or door head jambs and sill form a rebate all round for the frames to be set against. If the window openings are wide or do not come vertically over one another, necessitating wide or irregular spacing of columns, a beam can be placed over the lower wall columns in the air space, or over the lower interior columns to carry beams or columns at one floor level to be supported by a different spacing of columns below (see Fig. 16).

The floor slabs are carried entirely on the beams which are supported by the columns (see Fig. 5). The wall slabs carry only their own dead weight plus wind pressure.

Air stops (see Figs. 2 and 5), consisting of concrete slabs 6 in. wide and 1 in. thick, are bedded on the tie blocks approximately every fourth course in the walls, to stop the vertical circulation of air, increasing the resistance of the wall to the transmission of heat.

MANUFACTURE OF PARTS.

Wall Slabs—The wall slabs are not reinforced. They are plain concrete slabs (see Fig. 8), cast between polished steel plates, forty at a time. The exterior slabs can either be left with the smooth face produced by the polished steel, or cast with a facing of stone chips in white cement. The inside wall slab is made out of coke-breeze concrete into which nails can be driven and held as in wood. The interior trim of the building can be nailed up without difficulty. After the wall slabs have been cured, the inside faces of both the interior and exterior wall slabs are coated with asphalt paint (see Fig. 7).

Tie Blocks—Tie blocks (Fig. 10) are made in two operations. The longitudinal members (see Fig. 11) are first made and coated on the inside face with asphalt paint. They are reinforced with one rod near the outer face. At each of the tie-distance pieces or cross members a steel wire, bent like a hair-pin, is threaded over the main rod (see Fig. 11), and the member is cast with these wires protruding as shown. The longitudinal members are then placed together in another mould with the tie reinforcement overlapping (see Fig. 12). The cross member is then cast, uniting the two longitudinal members forming a small truss. The asphalt paint forms two definite stops to resist the transmission of heat and moisture to the cross numbers.

Posts—The posts (Fig. 15) are reinforced with four steel rods at the corners, bent over at the cap and base; two other straight rods are

added at the cap and base. Ties or links are used on the vertical rods, according to the stresses. The tee head and base is secured with bolts (see Figs. 3 and 20). This gives a margin of stability. The tee heads of the interior columns coming within partitions are fitted with steel plates to distribute the load from the beams on the concrete. If a column has to be exposed, the tee head and base is dispensed with and another type of cap and base issued. The columns in the interior walls are coated with asphalt paint on two faces, to stop the transmission of heat and moisture (see Fig. 10).

Beams—Beams (see Fig. 22) are cast in halves, with hollow spaces, to save weight. The half beams are reinforced with the usual straight and bent-up rods, with links at the stiffeners and some stirrups. The beams are cast in steel moulds, and the hollow spaces are formed with steel plates, which can readily be adjusted to any length of beam and any stiffener spacing. If it is decided not to expose the beam in the ceiling, the beam halves can be placed together web to web, and the ceiling slabs can rest on the lower flanges (see Figs. 3 and 23).

Floor Slabs—The floor slabs (see Fig. 9) are cast between polished steel plates in the same way as the wall slabs, but these slabs are reinforced on the under side with wire mesh. The rebated edge leaves a space for wooden fillets or cement grout. The slabs are bedded in cement mortar on the beams, and where wood finish is required the fillets are placed between the slabs as they are bedded on the beams, no cement grout being used between the slabs. The slabs being forced close together lock the fillets in place. If wood finish is not required the fillets are omitted and cement grout is run between the slabs as shown in Fig. 9. The wooden fillets hold nails for wood floor finish.

Roof and Ceiling Slabs—These slabs are made and reinforced the same as the floor slabs. Shingles can be stuck to the concrete with hot pitch.

Heads, Jambs and Sills for Window and Door Openings—These members (see Fig. 21) are cast in steel moulds. The window and door heads are reinforced in the same manner as the tie blocks (see Figs. 10, 11 and 12).

Corner or Quoin Slabs—These slabs (see Fig. 14) are cast between polished steel plates and are left smooth or can have a facing of stone chips in white cement. They are reinforced with steel rods. They are used for corner slabs only in the outside wall slab. These slabs are also used as quoins. Corner tie-blocks are used in the same way as the corner slabs. Both the slabs and the tie-blocks can be cast to any angle to suit any shape of bay window, etc.

Ornamental Mouldings. — Any ornamental mouldings or panels can be built into the wall as shown in Figs. 1 and 2.

The columns are usually spaced 4 ft. on centres in the side walls (see Fig. 4), and the wide windows placed in the front and rear walls, where the columns have no floors to support and only serve to stiffen the wall construction. Specially long window lintels can be suspended from the columns in the air space, as shown in Fig. 5. The window heads can be bolted to the lintels, as shown in Fig. 6.

All the wall parts and floor, ceiling and roof slabs are made in steel and machined cast-iron moulds, metal throughout. These parts are absolutely accurate and true, and fit together in true alignment without trouble.

All parts of the construction being precast concrete properly cured before being built into place, there will be no perceptible shrinkage in the structure and no shrinkage stresses. The most expensive architectural finish can be applied to the structure, immediately on completion of erection of the concrete work, without fear of damage or disfigurement. The joints can be made very small and are painted with asphalt paint on the inside to secure absolute air-tightness. Proper resistance is given to the transmission of heat throughout in the ceilings as well as the walls.

The house is essentially a house within a house. The inside surface of the outer house is coated with asphalt paint, and the outside surface of the inside house is coated with asphalt paint. There is no concrete which is solid with both the inside and outside concrete surfaces.

The faces of the columns, beams and ornamental work coming within the air space between the wall slabs are coated with asphalt paint, securing two definite stops for frost, dampness and transmission of heat.

The ceiling construction can be made as shown in Fig. 3. The surfaces of the ceiling beams and slabs are coated with asphalt paint. The space between the beams is to be filled with cinders up to the lower flange, and tamped. Building paper is then laid on the top of the cinders, with the edges tucked under the beam flanges, and sealed with asphalt paint. Concrete finish between the beams will hold the paper in place and protect it. The resistance to transmission of heat through this ceiling construction will be about equal to that of the wall.

A wooden roof, which will be cheaper than concrete, can be used without fire risk. The concrete ceiling will be water and wind proof, so it will not matter much if the wooden roof does

leak a little. The wooden roof will serve mainly as an architectural feature.

To further increase the resistance to transmission of heat through the walls, an additional slab wall can be built on the concrete floor slab, as shown in Fig. 7, the thickness of wall being made up as follows: 1¼-in. concrete slab, coat of asphalt paint, 6½-in. air space, coat of asphalt paint, 1¼-in. concrete slab, coat of asphalt paint or layer of tar paper, 1-in. air space, 1¼-in. breeze-concrete slab, and putty-coat plaster. It will take a very thick brick wall to give heat resistance equivalent to this wall constructuction.

The alternative roof or ceiling construction is shown in Fig. 23. The beams are placed web to web with ceiling slabs carried on the lower flanges and roof slabs carried on the top surface. The top of the beams can be graded with ordinary concrete for roof drainage.

If it is desired to increase the strength of the wall, the air space can be increased, permitting bigger section of column for vertical load and wind stress. The amount of concrete in the wall slabs will be the same; the only increase will be in the ties or cross members of the tie block, which is negligible. The weight of a 9-in. wall without column is 31 lb. per sq. ft. The weight of a wall including column is 38 lb. per sq. ft. If the wall is increased to 18 in. thick, the weight per sq. ft. without columns is 33 lb.

The weight of outside wall slab is 26 lb., and of the inside wall slab, 17 lb. The tie-block weighs 9 lb. per lineal ft. A 4-ft. block weighs 36 lb.

Each column weighs 240 lbs. Beams of 12 to 15-ft. span average 20 lb. per lineal ft. for half beam, so that the maximum weight to handle in one piece is 300 lb.

Floor slabs weigh 42 lb. each. Roof and ceiling slabs weigh 30 lb. each. The weight of a concrete floor complete, 15-ft. span, beams 4 ft. on centres, is 31 lb. per sq. ft.

A light breast derrick is all that is necessary to handle the concrete parts. The maximum weight to handle is 300 lb., so that there will be no trouble in man-handling in case of emergency. The total weight of the walls, floor, roof and ceiling of the house will be less than the weight of brick required for a similar structure.

The concrete parts are simple to make and to handle. They will stand rail or road transportation.

To build 4 sq. ft. of 9-in. wall, five concrete parts, average weight 24 lb., have to be handled, compared with 48 brick. To build 4 sq. ft. of 18-in. wall, five concrete parts have to be handled, average weight 26 lb., compared with 96 brick. This does not include wall columns.

It is easy work bedding the 1¼-in. slabs, and one can get full joints all the time, whereas in brick full joints are not secured. The labor required per sq. ft. is very much less than in a brick wall and only about one-thirtieth of the quantity of mortar is used.

APPLICATION.

This construction can be successfully applied to any structure with light floor loading such as schools, hospitals, offices, buildings and hotels, as well as domestic work. The reinforced concrete beams are made up to 15 ft. span to carry the concrete floor slabs 4 ft. long. For spans over 15 ft. steel main beams can be introduced and the reinforced concrete beams used as secondary beams 4 ft. on centres spanning between the steel beams. Structural steel columns can be used in place of reinforced concrete columns where the loads are heavy.

Any size or shape of structure can be built from the concrete parts. They are adaptable in every way. The beams and columns are the only parts that have to be cast specially if other than standard lengths are required. Any special lengths or sizes of the other parts can be cut from standard lengths very readily. Every opportunity is given for excellent architectural treatment.

The smooth face is exactly similar to cut Indiana limestone. A layman could not tell the difference. The face of stone chips in white cement has a texture all its own, and will compare favorably with any natural stone. The joints can be treated architecturally without any difficulty. Stucco finish can be given best on a coke-breeze slab, which can be used as an outside slab. Any finish can be used on the concrete floors, including hardwood, linoleum or terrazzo. If the concrete floors are thin and kept very dry and made waterproof, they will not be cold.

Following is a direct comparison between three identical structures of different types, in concrete, and in brick and timber construction, the quantities of materials given being complete* for the walls; for the floors, excluding surface finish such as hardwood; for interior partitions and ceilings, excluding the putty coat or finishing coat of plaster:

NINE-ROOMED HOUSE.

Having basement and first and second floors, 30 by 31 ft. over all. The average size of room is 13 ft. square.

Concrete	Timber and Brick House
Stone concrete, ... 47 c. y. = 62%	No. of brick, 42,000.
Coke breeze concrete, 29 c. y. = 38%	Timber in rough carpenter work, 5,250 f.b.m.
Total concrete, ... 76 c. y.	Lath and plaster work for interior partitions and ceilings, complete except for putty coat, 1,070 sq. yd.
Total weight of structure, 126 tons.	Total weight of structure, 195 tons, or 55% more than concrete structure.
Total number of concrete parts, approximately 7,000.	

* The concrete footings, basement floor, timber roof, putty-coat plaster and other trades are the same both for concrete and for timber and brick, and therefore are not included.

DETAILS OF CONCRETE PARTS.

Parts	No. of pieces	Average weight per piece	Percentage of total concrete
Slabs	5,360	28 lb.	61%
Beams and columns	192	280 lb.	21%
Tie blocks	1,060	26 lb.	11%
Concrete trim	360	50 lb.	7%

FIFTEEN-ROOMED HOUSE.

Having basement and first and second floors, 30 by 45 ft. over all. The average size of room is 13 ft. 3 in. square.

Concrete	Timber and Brick House
Stone concrete ... 64 c. y. = 60%	No. of brick, 48,000.
Coke breeze concrete,.. 44 c. y. = 40%	Timber in rough carpenter work, 9,500 f.b.m.
Total concrete, ... 108 c. y.	Lath and plaster work for interior partitions and ceilings, 1,730 sq. yd.
Total weight of structure, 177 tons.	Total weight of structure, 246 tons, or 39% more than concrete structure.
Total number of concrete parts, approximately 12,000.	

DETAILS OF CONCRETE PARTS.

Parts	No. of pieces	Average weight per piece	Percentage of total concrete
Slabs	10,000	22 lb.	63%
Beams and columns	315	235 lb.	21%
Tie blocks	1,120	27 lb.	9%
Concrete trim	490	50 lb.	7%

APARTMENT BUILDING.

One wing only, consisting of four apartments; basement and three floors; one complete six-roomed apartment per floor, approximately 48 by 26 ft. Average size of room, 12 ft. square.

Concrete Structure	Timber and Brick Structure
Stone concrete, ... 80 c. y. = 57%	No. of bricks, 74,000.
Coke breeze concrete,.. 62 c. y. = 43%	Timber in rough carpenter work, 14,000 f.b.m.
Total concrete, .. 142 c. y.	Lath and plaster in interior partitions and ceilings, 1,790 sq. yd.
Total weight of structure, 230 tons.	Total weight of structure, 350 tons, or 52% more than concrete structure.
Total number of concrete parts, approximately 16,100.	

DETAILS OF CONCRETE PARTS.

Parts	No. of pieces	Average weight per piece	Percentage of total concrete
Slabs	13,600	22 lb.	64%
Beams and columns	376	265 lb.	22%
Tie blocks	1,500	25 lb.	8%
Concrete trim	560	50 lb.	6%

The above-mentioned concrete structures were designed upon the following basis: Wind pressure—30 lb. per sq. ft.; floors—concentrated load of 250 lb., or distributed load of 50 lb. per sq. ft.; roof—40 lb. per sq. ft.

It should be particularly noted that in the three representative structures given above, an average of 40 per cent. of the concrete is coke-breeze concrete in the form of plain slabs not reinforced, and a further 22 per cent. of the stone concrete is in the form of slabs, making in all 62 per cent. of the work in concrete slabs. Coke-breeze is a very cheap aggregate, and the slab is the cheapest and simplest form of concrete product. On the average the brick and timber structure is 49 per cent. heavier than the concrete structure, so the saving on labor and freight would be considerable.

Prices allowed for the materials and labor on the quantities given above may vary somewhat in different localities, but it is evident that the total for the concrete work, compared with the total for brick and timber construction, allows a substantial price per cubic yard for the concrete structure, especially for the stone concrete.

COST OF CONSTRUCTION.

Take the cost of brick work erected to be $45 per 1,000, the cost of the timber floors and studdings in place to be $120 per 1,000 ft., and the cost of lath and plaster to be $1 per sq. yd. *These prices are exclusive of contractors' profits.* Applying these prices to the above examples, the cost of brick, timber, lath and plaster, and equivalent concrete, works out as follows:

	Total cost of brick, timber, lath and plaster	Total concrete	Price per cu. yd. of concrete giving same total cost
Nine roomed house	$3,590	76 cu. yd.	$47.20
Fifteen room house	$5,030	108 cu. yd.	$46.60
Apartment building	$6,800	142 cu. yd.	$47.90

The concrete structure described can be erected, *including profit,* for $59.75 per cu. yd. for stone concrete, and $27.16 per cu. yd. for breeze-concrete.

In the proportions of 60 per cent. and 40 per cent., this gives an average price of $46.72 per cu. yd., which compares favorably with the above price which averages $47.23 per cu. yd.

The approximate selling price in Toronto for the above described construction erected any place within the city limits is as follows:

Exterior walls 57c per sq. ft. (including wall columns), Floors 62c per sq. ft., including interior beams and columns.

Solid interior breeze concrete partitions, 20c per sq. ft.

Hollow interior breeze concrete partitions, 25c per sq. ft.

Ceiling (including interior beams and columns) 59c per sq. ft., (One slab with coat of asphalt paint.)

Ceilings (including interior beams and columns) 81c per sq. ft., (Two slabs each with coat of asphalt paint.)

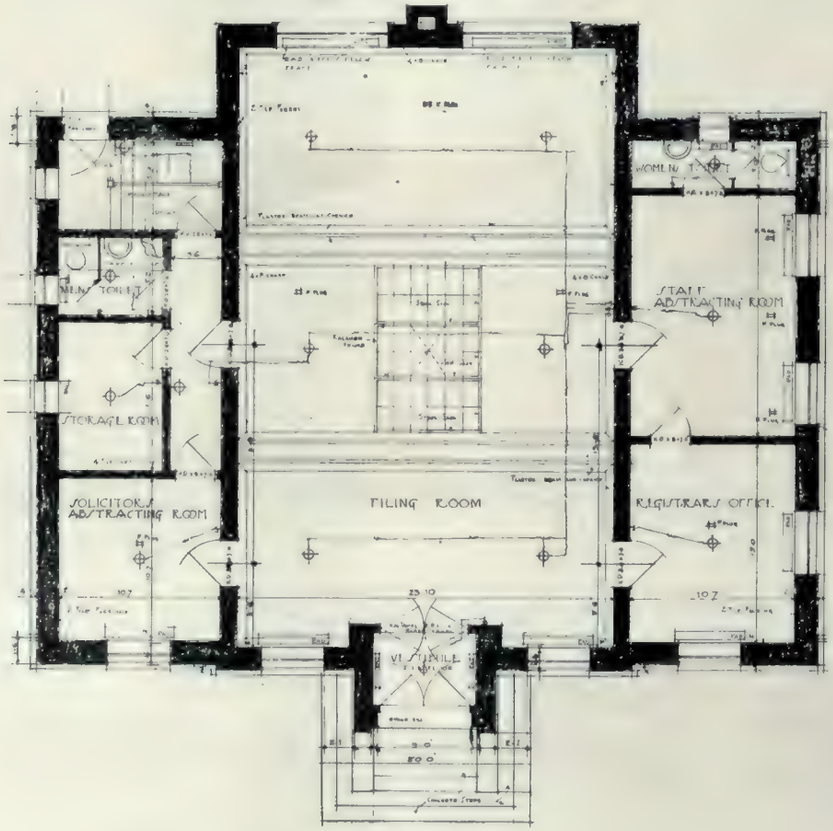
All the surfaces of the concrete work in the walls, floors, ceilings and interior partitions are smooth and mechanically true, ready to receive putty-coat plaster or paint as desired to give a completely finished job.

There will be considerable saving in coal consumption due to increased resistance to transmission of heat. There will be no maintenance charge for the structure, as there is no deterioration in concrete and no shrinkage in precast parts. There will be no fire risks on the concrete structure, as it is fireproof. These advantages should be taken into consideration as well as first cost.

Marble and granite to the value of $922,725 were quarried in the Province of Quebec in 1920.

SOUTH-EAST VIEWPOINT.

HALTON COUNTY REGISTRY OFFICE MILTON, ONT.



GROUND FLOOR PLAN.

MOLESWORTH, WEST AND SECORD, ARCHITECTS.

Halton County Registry Office, Milton, Ont.

This building is a happy solution of the problem presented in a land titles and registry office for a well populated rural district.

It provides a goodly portion of easily accessible filing space and comfortable quarters for the permanent staff. There are also facilities for lawyers and others who use the records. This latter was an important item at Milton as the office is used extensively by solicitors from both Toronto and Hamilton who stop over between trains frequently.

The plan was carefully studied to provide for the future extension of the filing and storage space. This can easily be done to the rear.

Stone from the local quarries is used for the exterior in order to utilize local material and to conform to an extent to the Court house which adjoins. The stone was difficult to work and detail was on this account kept very simple.

Needless to say the building is completely fireproof. The floors and roof are of reinforced concrete with suspended ceilings. The doors and trim are kalameined and the windows of the metal casement type.

Architects' Dinner and Smoker

The first dinner and smoker of the year of the architects of Hamilton was held on April 18 at the Royal Connaught Hotel, and proved to be a most enjoyable affair. A feature of the evening were two 'cello solos by Mr. Bert Hutton, one of the city's most accomplished 'cellists, and an interesting address by Mr. J. P. Hynes, of Toronto, who sketched the efforts which have been made by architects to secure legislation, and the features of the present bill now before the Ontario Government.

The occasion was also accepted as an opportunity for discussing the employing of outside architects for the nurses' home of St. Joseph Hospital, with reference to which the following letter of protest was sent to the city authorities:

To the Mayor and Board of Control,
Hamilton, Ont.

Gentlemen:

The Hamilton Chapter, Ontario Association of Architects, representing the entire profession in this city, offer for your consideration the following facts relative to the appointment of Hamilton architects for civic, public and semi-public buildings in general, and the Nurses' Home os St. Joseph Hospital in particular.

We are given to unherstans that the firm of Beckett & Ackitt, of Detroit, Mich., has been commissioned to prepare plans for the St. Joseph Nurses' Home, and while it is recognized that both members of the firm are Canadians, and one a former Hamiltonian, it is nevertheless a fact that their status is that of foreign architects, inasmuch as both are, and have been for several years, practicing in Detroit, Mich., and are both domiciled in that city.

The following points are suggested as being worthy of your consideration:

(1) That "Buy in Canada" and "Buy in Hamilton" slogans apply to every trade and profession, and are worthy of the support of Canadians and Hamiltonians.

(2) That $50,000 has been donated by the Board of Control to assist in the erection of the Nurses' Home of St. Joseph Hospital, and that this expenditure is borne by the ratepayers of the city, and further that the Mayor of the City of Hamilton is a member of St. Joseph Hospital Trustee Board.

(3) That in the ordinary course of events, a proportion of this amount of $50,000 will go to foreign architects in the shape of fees.

(4) That the architects of Hamilton being ratepayers, consider it right and proper to expect that one of their number should be chosen for this work or any other work where civic money is spent.

(5) Finally, in the light of the above facts, we deem it due to the architects of Hamilton that we be permitted to send representatives of our Chapter so that we might place our views more fully before you.

Faithfully yours,
The Hamilton Chapter O.A.A.,
Per Geo. T. Evans,
Secretary.

Architecture and Landscape Gardening

An interesting talk on landscape gardening and architecture was delivered by Mr. H. B. Dunnington Grubb at the recent exhibition of the Toronto Chapter of the Ontario Association of Architects. Monuments realizing the perfect union of architecture and landscape gardening, the lecturer declared, represented the noblest works of man in the expressing of his personality; the greatest works of savage nature were never capable of thrilling the sensitive imagination like conventionalized nature tamed and controlled and adapted by man to his needs.

In view of this, great responsibility rested with both the architect and the landscape gardener owing to the part they played in influencing national standards of living and determining national characteristic. Both were called upon to express the personality of the owner through their own personality. Sympathetic co-operation between the two professions was essential. Their two arts, while said to meet at the ground line, really overlapped much further, and without co-operation it was impossible to lay out an estate satisfactorily. There was the question of aspect, access, orientation, and views, and many other things to be considered when designing and locating a house and laying out an estate to its best advantage.

The lecturer contrasted the present with the time when ancient civilization rose to power and luxury and landscape gardening was the pastime of kings and princes, declaring that the art to-day had fallen into the hands of ignorance and cupidity, with the result that many fine buildings did not receive the setting they deserved.

The Ottawa Conference

Existing conditions in the building industry, together with steps for their improvement, were discussed at a joint conference of employers and employees of the construction industries, which convened at Ottawa on May 3, 4 and 5, at the request of the Minister of Labor, the Hon. Gideon Robertson.

Arrangements for the conference, which was attended by 66 delegates with equal representation on both sides, were made in accordance with wishes of a joint committee of workers and employers designated by the Joint National Conference Board of the building and construction industries with a view to considering the various factors responsible for the present building slump and of determining, if possible, some means of stimulating activities. Information relative to the building situation throughout the Dominion in reference to wages, cost of living and employment in this branch of the industry, was prepared by the Department of Labor and placed at the disposal of the delegates.

The agenda of the conference was as follows:

1—Existing conditions in the industry: (a) Shortage of dwelling, commercial and public buildings; (b) seasonal nature of the industry and possible methods of regulation.

2—Apprenticeship and craftmanship: (a) Consideration of National Joint Conference Board proposals; (b) development of technical training.

3—Costs and production: (a) Factors in building costs: (b) efficiency and its relation to production; (c) hours of labor; (d wages and their relation to the cost of living.

4—Conditions of employment: (a) Distribution of labor; (b) unemployment insurance; (c) industrial safety.

5—Development of Joint Industrial Councils.

During the discussion it was pointed out that the total housing shortage for the year 1920 was estimated at 79,000, while the country at the present time could actually do with double that number of dwellings. It was further estimated that the total volume of deferred projects, including public works, houses and buildings of all kinds, at the present time, amounted to $780,000,000. Instead of the improvement which was looked for at the beginning of the year materializing, building contracts for the first three months of 1921 amounted to only $37,000,000 in Canada, as against $56,000,000 for the corresponding period in 1920, or 35 per cent. less.

It was further pointed out with labor costs, direct and indirect, forming 80 per cent. of the total building costs, that no important improvement could come without reducing wages and greatly increasing the efficiency of labor, both on construction and in the manufacture of the materials used.

The position of the employers was set forth in a resolution declaring that a reduction from 20 per cent. upward had already been made in a number of materials, and that every means possible have been made to induce labor to do its share, but unsuccessfully. It was felt that the building trades, in order to conform to the reduction of materials and the wages of workers in the factory and mill, should be reduced from 10 to 20 per cent., depending on conditions.

On the other hand, the representatives of labor contended that in the matter of wages and their adjustment there has never been any national standard established or national declaration as to the amount of wages the worker should receive during the time in which the cost of living was increasing. Therefore, any adjustment actually necessary at the present time should be arrived at by agreement between employers and employees of the building trades industries in their respective localities.

Mr. J. P. Anglin, of Montreal, speaking for the employers, stated that if no agreement was reached on this point the conference would have an anti-climax. A swing toward wage reduction had already begun and that if no agreement was reached it might go farther than was desirable. A reduction of 25 per cent. in wages had already been agreed upon in Detroit, which was the centre from which wage movements in Eastern Canada had recently taken their rise. There were reductions also in a number of Canadian cities. He suggested that the conference, if it could not agree upon a percentage of reduction, should adopt the principle that a reduction should take place.

After reaching a point of deadlock, the following resolution was finally adopted and endorsed by both parties to the discussion:

The General Committee of this Joint Conference of Employers and Employees in the Construction Industries begs to report that it has had three meetings during the sessions and has considered without hesitation some of the vital questions of our industry with a view to aiding this conference in arriving at a satisfactory conclusion. The chief questions on which no agreement has been reached at this time, either in committee or in the conference itself are those of wages and the methods which have been used to obtain wage reductions.

After the most serious and careful consideration and with a full knowledge that we are not in any sense a legislative or authorized body, but a voluntary one, and therefore, without jurisdictional powers, beg to recommend the following:

(*Concluded on page* 158.)

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:

MONTREAL—171 St. James Street.
C. S. Soutter, Representative.

WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue.
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, May. 1921 No. 5

The Live Stock Arena Contract

The City Council of Toronto, after making a rather sorry mess of the Live Stock Arena contract, has decided to adhere to the low-tender principle, and will award the work to Anglin-Norcross, Limited, whose figure of $892,000 was the lowest bid originally submitted. In rescinding its order to have the City Architect proceed with the work, and in voting down the proposal to call for new tenders, the Council has not only extricated itself from an unenviable position, but it has preserved Toronto's good name and reputation for square dealing. While there is much to be said in favor of the principle of giving city work to local contractors, there is no excuse or justification for rejecting the bid of a reputable concern which was encouraged to tender, simply on the grounds that its head office is in another city. The whole affair, to say the least, was a regrettable piece of municipal muddling savoring of petty politics and vote-catching methods. The above firm not only maintain an office organization and pays a business tax in Toronto, but its agreement is to employ Toronto labor and to purchase as far as possible all materials in the local market. In view of this, it seems altogether unfortunate that a delay should have been occasioned in accepting the contract in question. As it is, very valuable time necessary to the completion of the building has been wasted, and it is only by rushing the work at all possible speed that the project can be carried out in the time specified.

Toronto Chapter Exhibition

It is to be hoped that the exhibition of the Toronto Chapter, held during the past month, now that we are again in peaceful times, will become an annual affair, or, better still, that it will resolve itself into a yearly event embracing under the O.A.A. the work of the architects throughout the province and not of Toronto alone. The exhibition was altogether an interesting collection of photographs and drawings, gotten up on extremely short notice and noteworthy both as to the diversity and merit of the work shown. An added feature of the display was a number of notable pieces of sculpture, and it is to be hoped in the future more work of this character will be represented.

In fact, considerable opinion exists that the ideal exhibition would be one bringing within its scope not only architectural subjects, but sculpture, craftsmanship and interior decorations, something similar to the exhibition of the New York Architectural League, which has developed into a remarkably fine annual display of associated arts. An event on such a scale, of course, would have to be planned and organized well in advance, in order to make it representative in character, but there is no question but that it could be made a success. The suggestion, to say the least, seems feasible and has much to commend it.

Not only would an exhibition of this kind unquestionably appeal to those who would be invited to take part in it, but it would have that general interest which would receive a wide measure of public support.

Standard Form of Contract

The Committee on Contracts of the General Contractors' Association in the United States, in its annual report states that the principal advantage of a standard form of contract is that in the course of years the interpretation of such

a contract by the courts will cover practically every contention which may arise and thereby remedy the uncertainties which will always obtain in using a new, untried and too frequently loosely drawn form of contract. It points out that it is of little avail to adopt a standard form of contract until the form has been thoroughly studied and all of its provisions subjected to the closest scrutiny and criticism.

The Committee further declares that the adoption of a tentative form would have no advantage in building up judicial interpretations that the standardization of a form of contract to fit all conditions will, in the nature of things, be a tremendous task and that its realization must extend over a period of years.

Government Ownership of Cement Mills

Commenting on the Ontario Government's proposal to establish a plant for the manufacture of cement, Mr. F. P. Jones, managing director of the Canada Cement Company, Ltd., presents a number of arguments why such an enterprise would prove an unwise and costly step. In this connection he states that cement is 80 to 90 per cent. higher than it was before the war, and that in his opinion there are few commodities showing such a small increase. "We are hopeful that, as the cost of fuel, cotton sacks and other commodities comes down we will be able to steadily reduce our price and eventually get it down to at least close to the pre-war prices.

"That will come as soon as other reductions justify it, whether the Ontario Government or anyone else builds a cement mill, and I am satisfied that before any mill can be built in Canada prices will be so low that a new mill will have great difficulty in earning interest on its capital and on the working capital which it must have.

"It is evident the Ontario Government figures the mill will cost about $3 per barrel to build. I doubt very much if they can build at that figure at all. Even if they do, they will have to have considerable working capital in addition to the $1,000,000 for the construction of the mill. The Canada Cement Company's mills stand on their books at $2.14 per barrel."

As regards existing plant facilities, Mr. Jones said that "Canada can already produce more than double its requirements of cement.

"Last year the quantity of cement on the market was limited by a coal shortage, not a cement shortage. The Canada Cement Company had to lend the Dominion Government coal last year to keep their buildings warm.

"Last year we sold cement in Canada at a lower price than in England or the United States. The duty on cement to-day is 8 cents per 100 pounds, or about 16 per cent. ad valorem, and yet no one can import cement, so that our prices cannot be much higher than those in the United States."

Government Aid for Housing

Consideration of the housing problem in the cities of Canada, and its application from the standpoint of providing work for the unemployed, as well as homes fo rthe workers, will be the outstanding business of the annual convention of the Ontario Provincial Command, G.W.V.A., at Brantford on May 24, 25 and 26, under the chairmanship of the president, Lieut.-Col. E. D. O'Flynn of Belleville. Several local branches of the G.W.V.A. have prepared resolutions for submission to the convention on the housing question.

One of these, from the Ottawa branch, proposes that the Federal Government be asked to set aside $50,000,000 for this purpose, to be used under the direction of the Soldiers' Settlement Board to assist city returned soldiers in building their homes. Loans up to $5,000 from this fund are suggested to assist these men, on the understanding that the erection of the building and purchase of materials will be under the supervision of the Soldiers' Settlement Board.

Construction of Chimneys

A compilation of notes on chimney construction, based on recommendations made by the National Board of Underwriters in the United States, is contained in a 12-page pamphlet recently issued by the Vitrified Clay Pipe Publicity Bureau, 9 Wellington Street East, Toronto. The text matter deals with approved methods of chimney construction, the protection of surrounding woodwork, and the questions of economy, safety and security. There are several diagrams of practical value, and a table dealing with sizes, weight and cost of flue lining. Copies will be sent to interested parties on request.

Construction Industries' Association Moves to New Offices

A notice sent out by J. Clark Reilly, executive secretary, announces that the head office of the Association of the Canadian Building and Construction Industries at Ottawa, is now located at 44 Central Chambers, one block west of the Union Station. Heretofore the Association has had temporary office space with the local Ottawa branch, but the executive deemed it advisable to secure separate quarters, with the result that very suitable offices have been leased at the above location, which will hereafter be the headquarters address.

Large Statue Castings

The Architectural Bronze and Iron Works, Toronto, with whose very high standard of workmanship most architects and sculptors are familiar, have enlarged their bronze casting department so as to enable them to produce not only architectural bronze work, memorial tablets and sculptural pieces, but also bronze statue castings up to a large size. One of their recent large castings is seen in the accompanying illustration of a soldier monument executed for J. A. Tingley & Sons, Amherst, N.S., and which is to be used in a place called the "Great Village." This statue is 6 ft. 6 in. high and weighs about 600 lbs., and was produced by what is known as the "French system" whereby the parts are cast separately and united afterwards to make up the whole. The advantages claimed for this system over what is known as the "wax process" in which the entire casting is made in one piece, is that it produces a statue in which all parts are uniformly sound, that it permits of putting the most metal where the strain is the greatest, and that in event of an accident to any part in casting it can be easily repaired or started anew without the necessity of recasting the entire statue. Moreover, the casting which is made in sand, it is claimed, results in better impressions, while a further advantage is the fact that the thickness of the casting is more easily regulated, so that some of the largest equestrian statues may not be over ¼ inch in thickness of metal.

BRONZE STATUE

6 ft. 6 in. high.

Produced by the Architectural Bronze & Iron Works, Toronto.

While the casting in question is not of an architectural character, it is nevertheless of a magnitude which fully demonstrates the fact that Canada is in a position to execute work which has heretofore been done outside the country.

The bronze casting department of the company is in charge of Mr. H. T. Allebaugh who prior to taking up his residence in Canada was for a period of twenty years connected with the Gorham Manufacturing Company of Providence, R.I., and a special invitation is extended to architects and sculptors to visit their foundry with a view to seeing in a practical way how architectural bronze work and large statuary pieces are molded and produced.

Protection for Reinforced Concrete Against Electrolysis

A waterproof shell protecting the concrete structure, a contemporary state, is the most plausible form of protection of reinforced concrete against electrolysis because the arrangement not only protects the reinforcing bars from moisture and later oxidation but also protects the concrete surrounding the rods from abrasion and, eventually, exposure of the iron. Last year it was suggested that the following methods be considered: (1) Use of copper plated reinforcing bars; (2) Introduction of reinforcing bars made of copper alloy; (3) Reinforcing bars surrounded by rough insulating enamel impervious to salt water and moisture; (4) Waterproof plastic layer of material with petroleum asphalt base, or some established waterproofing material free from electrolytes, surrounding base of concrete.

Further studies have led to the conclusion that the first three methods proposed are not practical because of high cost.

The fourth method is recommended, but attention is called to the necessity of using the proper waterproofing material on the inside of the protecting shell. The waterproofing pitch should remain flexible for an indefinite time; should have a melting point in the neighborhood of 200 deg. F., and be elastic in stretch at least ½ inch at a temperature below freezing and have approximately an inch stretch at 60 deg. F. If the pull is gradually applied, the stretch should be approximately 6 to 7 in. at 60 deg. It is rather a surprising fact that such waterproofing material has been manufactured for twelve or fifteen years, but in general use only for roofing material and in pavements. It is made by distillation of an asphalt base and oxidized by blowing with air, the latter process giving the material the stretching quality.

Asphaltic petroleum pitch is soluble in gasoline, which is likely to be present in city sewerage, but recent experiments show an elastic waterproofing pitch may be made from coal tar that is insoluble in gasoline but retains all of the characteristics of the asphaltic petroleum pitch.

The Ottawa Conference

(*Continued from page* 154.)

Whereas there now exists a condition of either strike or lockout in our industry in several of our Canadian cities because of the so-called arbitrary reductions demanded by employers; and

Whereas this condition is the result of a general abnormal situation over which we could not possibly have any control; and

Whereas the post-war unnatural high peak in cost of living, and therefore, in wages was passed last year; and

Whereas in many important centres throughout Canada and adjacent U.S. points wage adjustments have been reached by mutual agreements or arbitration; and

Whereas the chief deterring factor which prevents a real substantial reduction in cost of living is undoubtedly high rent; and

Whereas it is realized by us that only the building of many thousands of dwellings can alleviate Canada's deplorable housing shortage; and

Whereas it has been conclusively shown in this conference that building material prices have already been substantially reduced;

Therefore, be it resolved by this conference, acting as individual builders and workers, and not in our capacity as officers of any particular organization, and with the full realization that each locality must of necessity deal with its own peculiar situation, as follows:—

That in our own best judgment a moderate and reasonable adjustment of wages should be agreed upon without further delay in such large centres, where an abnormally high peak has been reached and where no settlement has been accepted, and that such agreement should be fixed upon for a period of twelve months; and further that we strongly urge the immediate resumption of negotiations with a view to mutual agreement, and that failing mutual agreement, voluntary arbitration should be entered into.

In conclusion, your general committee feels that this action will tend to stabilize conditions by preventing an undue and abnormal drop in wages, and remove strikes, strife and distrust, and that a new post-war normal will more speedily be determined.

Both parties to the conference agreed that the eight hour day was conducive to the greatest efficiency, but objection was taken by the employers to making it a subject of legislation.

"Steelcrete" Again Produced in Canada

It will be interesting news to architects and engineers throughout the Dominion to know that the expanded metal reinforcing known as "Steelcrete" is again available from a Canadian producer. Many distinctive advantages are claimed for this material, which may be briefly enumerated as follows:

1. Great unit strength combined with a high elastic limit.
2. A uniformity of quality and stiffness which make a reinforcing so taut that it requires no stretching or placing to eliminate "waves."
3. Because of its sheet form it is handled with great ease, thus permitting greater use of unskilled labor with a resulting saving in cost.

"Steelcrete" is made in an extensive range of sizes by the cold drawn process. Special machinery first slots the steel sheets and then expands it into a diamond-shaped mesh. The weight run from 20 pounds per 50 square feet to 2 pounds per 50 square feet, and it is supplied in sheet lengths from 8 to 16 feet.

The approximate size of the strands vary from 1-16 x 7-64 inches to 13-64 x 23-64 inches. In these dimensions the first fractional figure represents the thickness of the gauge, while the second fractional figure represents the thickness of the strand.

Figuring on the short way of the mess across the sheet, the widths of the sheets vary from 4 feet 8 inches to 8 feet. Eight feet is the arbitrary maximum made necessary by the limitation of space in railroad cars. The material comes in a range that takes care of practically all demands for reinforcing of this character.

The fact that this material is now being produced in Canada will eliminate the long haul plus the duty and the delays that are almost inevitable in receipt of imported goods shipped by freight. It is understood that the Pedlar People, Limited, of Oshawa, Ont., who manufacture "Steelcrete" carry a majority of twenty-one styles in stock, a circumstance that should prove a convenience to engineers and contractors who are pressed for time.

J. P. Anglin, B.Sc., President. *H. J. Gross, Vice-Pres. & Treas.* *C. D. Harrington, B.Sc., Vice-Pres. & Manager.*

ANGLIN-NORCROSS LIMITED

CONTRACTING ENGINEERS AND BUILDERS.

MONTREAL TORONTO HALIFAX

Solignum

Wood Preservative—Shingle Stain—supplied in special grades for interior woodwork. Made by Major & Co., Limited, Hull, England.

FLINTEX

The finest enamel for plaster or wood; flat or gloss, in colors. Made by Paripan Limited, London, England.

PARIPAN

Concrete hardener—makes floors dust, frost and wear-proof. Made by us here.

STURGEONS

French Polish Wax—the best wax on the market for all purposes. Made by us here.

STURGEONS LIMITED BRITISH PAINT SPECIALTIES 64-66 RICHMOND STREET E., TORONTO

Toronto, June, 1921 Vol. XIV., No. 6

CONTENTS

CANADIAN BATTLEFIELDS MEMORIALS COMPETITION: Notes on First Stage 161
By Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A., Architectural Adviser to the Commission.

CANADIAN BATTLEFIELDS MEMORIALS COMPETITION: Final Stage 163

BUILDING MATERIAL RESEARCH WORK 172
By Alan E. Mumby.

RAWLINSON SCHOOL, TORONTO 175
By A Visitor

JOHN ROSS ROBERTSON SCHOOL, TORONTO 177

SMALL SCHOOL, OAKVILLE, ONT 183

O. A. A. NOTES 184

EGYPTIAN GOVERNMENT HOSPITAL COMPETITION 185

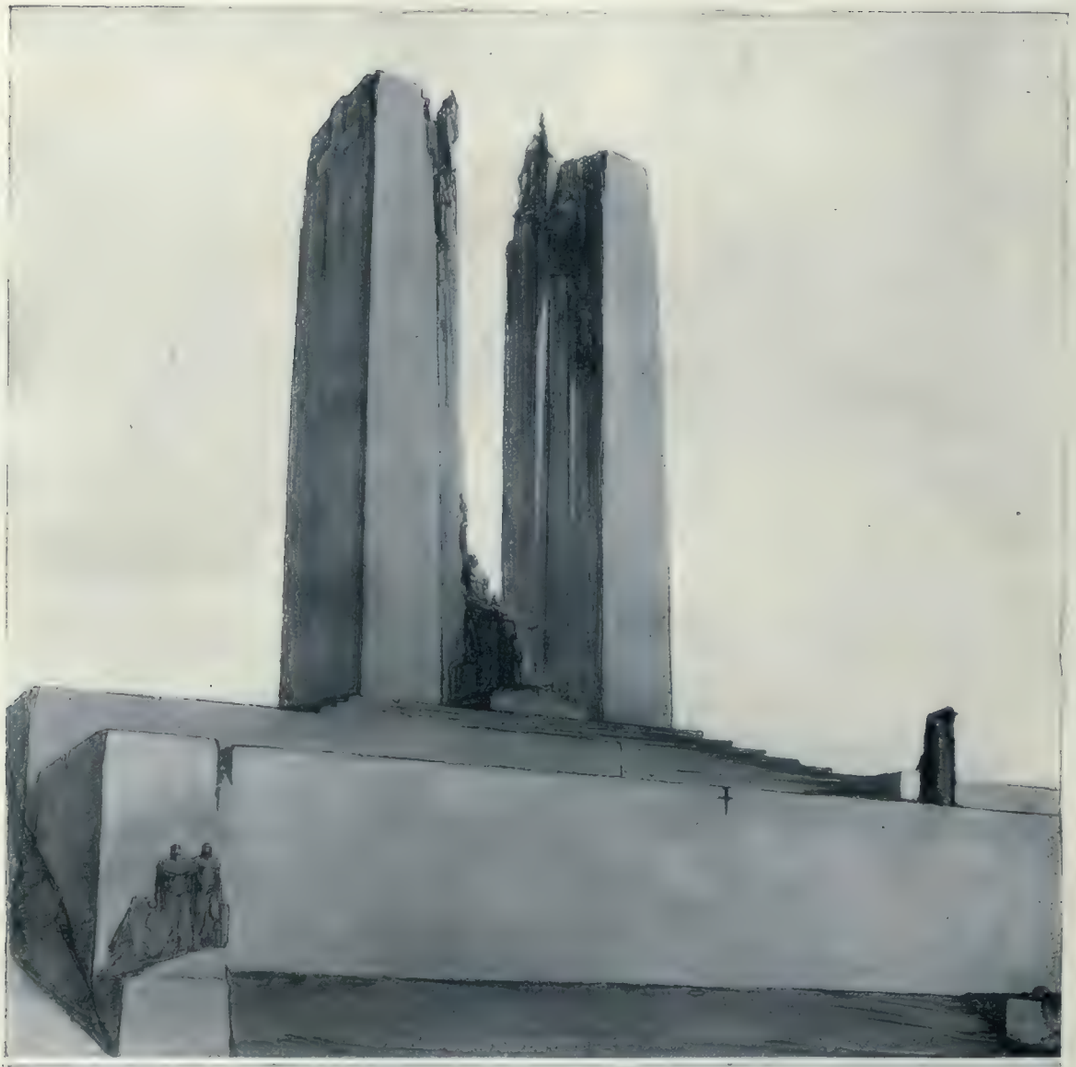
FLAT ROOFS OF CEMENT CONCRETE 187

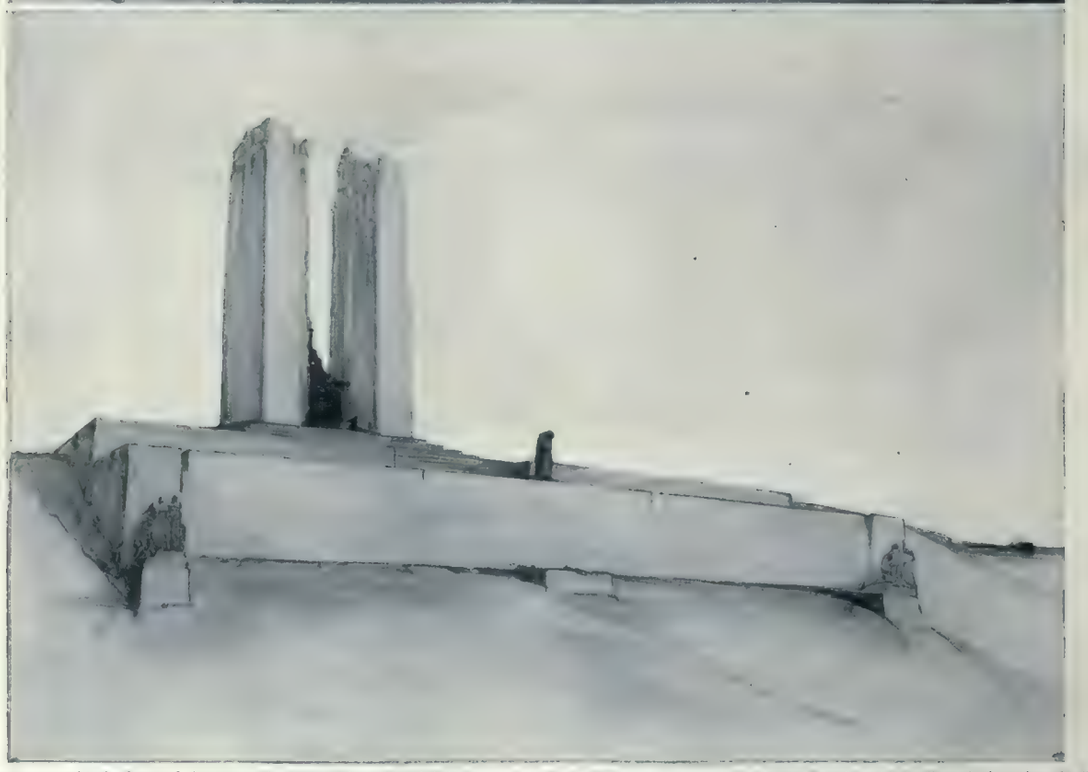
EDITORIAL 189
A Recent Legal Decision.

FRONTISPIECE:

CANADIAN BATTLEFIELDS MEMORIALS COMPETITION: Design by Walter S. Allward.

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK





DESCRIPTION: At the base of the strong impregnable walls of defence are the Defenders, one group showing the Breaking of the Sword, the other the Sympathy of the Canadians for the Helpless. Above these are the mouths of guns covered with olive and laurels. On the wall stands an heroic figure of Canada brooding over the graves of her valiant dead; below is suggested a grave with a helmet, laurels, etc. Behind her stands two pylons symbolizing the two forces — Canadian and French—while between, at the base of these is the Spirit of Sacrifice who, giving all, throws the torch to his Comrade. Looking up they see the figures of Peace, Justice, Truth and Knowledge, etc., for which they fought, chanting the hymn of Peace. Around these figures are the shields of Britain, Canada and France. On the outside of the pylons is the Cross.

DESIGNS BY WALTER S. ALLWARD

CANADIAN BATTLEFIELDS MEMORIALS COMPETITION.

The Canadian Battlefields Memorials Competition

Notes on First Stage

Percy E. Nobbs, M.A., F.R.I B.A., R.C.A., Architectural Adviser to the Commission

IT IS hoped that steps taken to advertise this Competition last autumn resulted in every architect in Canada (to say nothing of sculptors and other artists) being made aware of the project, and that it is therefore unnecessary to dwell at length upon the inception of the scheme.

DESIGN BY F. CHAPMAN CLEMESHA.
CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

In May, 1920, a Parliamentary Committee took evidence on the project, and a Commission was appointed consisting of the following: Major-General the Honourable S. C. Mewburn, C.M.G., K.C., M.P., the Honourable Rodolphe Lemieux, K.C., M.P., Lt.-General Sir R. E. W. Turner, V.C., etc., Lt.-Colonel R. W. Leonard and the Honourable J. G. Turriff, and at its first meeting the Honourable S. C. Mewburn was appointed Chairman.

From the very inception of the project the intention has been the erection, on an adequate scale, of a series of landmarks on the battlefields of France and Belgium at eight spots where the Canadian Corps accomplished its most notable achievements. It is a corollary of this idea that these monuments must have some common characteristics as landmarks, while from the nature of the sites it follows that considerable variation in design will be both natural and necessary as regards the bases and precincts.

The conditions in the preliminary Competition left absolute freedom of design, with a view to encouraging originality of thought in the suggestions offered, and on the chance that competitors might show some general consensus of opinion as to what form would be most suitable.

In the preliminary Competition 160 designs were submitted, of which about 100 showed technical ability on the part of their authors—a very gratifying response. Some very original solutions of the

DESIGN BY A. J. KING.
CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

problem were offered but nothing that could be construed as a general consensus of opinion emerged from the competition.

In making their award, the assessors made it clear that they had found designers, but left the character of the design they would finally recommend dependent upon the results in the second stage of the Competition. Thus the designs by the successful competitors represent a variety of solutions from obelisks to sarcophagi and ranging in method between romantic mysticism and classic pellucidity.

From a perusal of the conditions for the final stage of the Competition, it will be noted that something more is required of the competitors than the mere development of the ideas submitted in the first stage, which served to gain for their authors admission to the final competition. The restrictions in design have, however, been drawn in as elastic a nmaner as possible.

It will be noted that while the commissioning of eight designers would be a result quite in accord with views of the Commission as expressed in the conditions, it is open to the assessors to make their award in favor of one designer for the eight monuments, or such other distribution as the results may warrant.

With regard to the general principle of erecting these eight landmark monuments upon the sites purchased and prepared for them, a very natural question has been raised from several sources, "Why not concentrate on one large monument?" and there is no doubt but that solution offers very considerable attractions at first sight. It may not be out of place to state some of the considerations the Commission has had in view:

1. A project is already well advanced for a British War Memorial to be situated in the Ypres salient, in addition to various minor regimental ones elsewhere. As Great Britain declared war and made peace, involving the whole Empire in these transactions, it follows that the several parts of the Empire should be—and no doubt will be—given very adequate prominence in connection with that monument.

2. For the several parts of the Empire to erect monuments competing in any way with the dignity of this British monument, would be unfortunate

DESIGN BY DUKE W. ROWAT.
CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

in many obvious ways. One may be mentioned. Such action would not express the historical facts of 1914-1918, however consonant it might be with the reorganization of Imperial responsibilities now taking place.

3. The part taken in the War by the Canadians was a very distinctive one, in which all who worked towards it take immense pride, however humble their parts. The corps became an extraordinarily efficient instrument, and was used again and again, at various points, in virtue of special characteristic qualities. Every man in the corps felt, knew and understood this, often passionately.

Now, something of the foundation of this emotion —the finest experience in the lives of many thousands —can be made clear and plain to those who follow, by a just, historical disposition of adequate landmarks. The very distances between them contribute to their monumental values; the whole wide landscape the soldiers knew is thus enlisted to perpetuate their spirit.

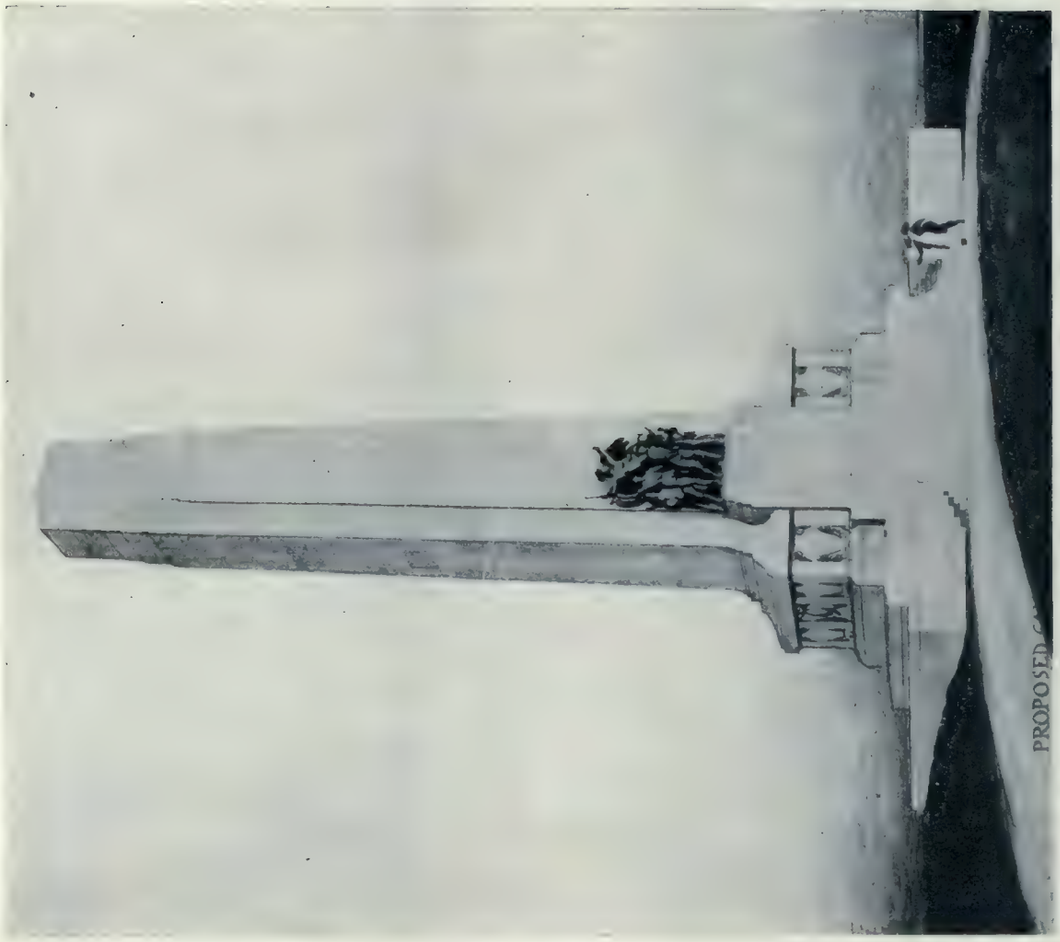
4. The execution of the scheme, it is true, may serve to record facts which suggest comparisons. Not all belligerents have achievements to their credit which would warrant such a series of memorials. But there is nothing inherently bombastic in writing down historic facts—as did the Egyptians and the Romans—in large characters of enduring stone. The judgment of the Assessors selected can be relied on to save us from over-assertion.

5. The place for a large, representative Canadian War Memorial is Ottawa. Nothing done in France or Belgium should be allowed to detract from that. For Canada, the War marks an epoch to be recorded in the Canadian Capital in the fullness of time.

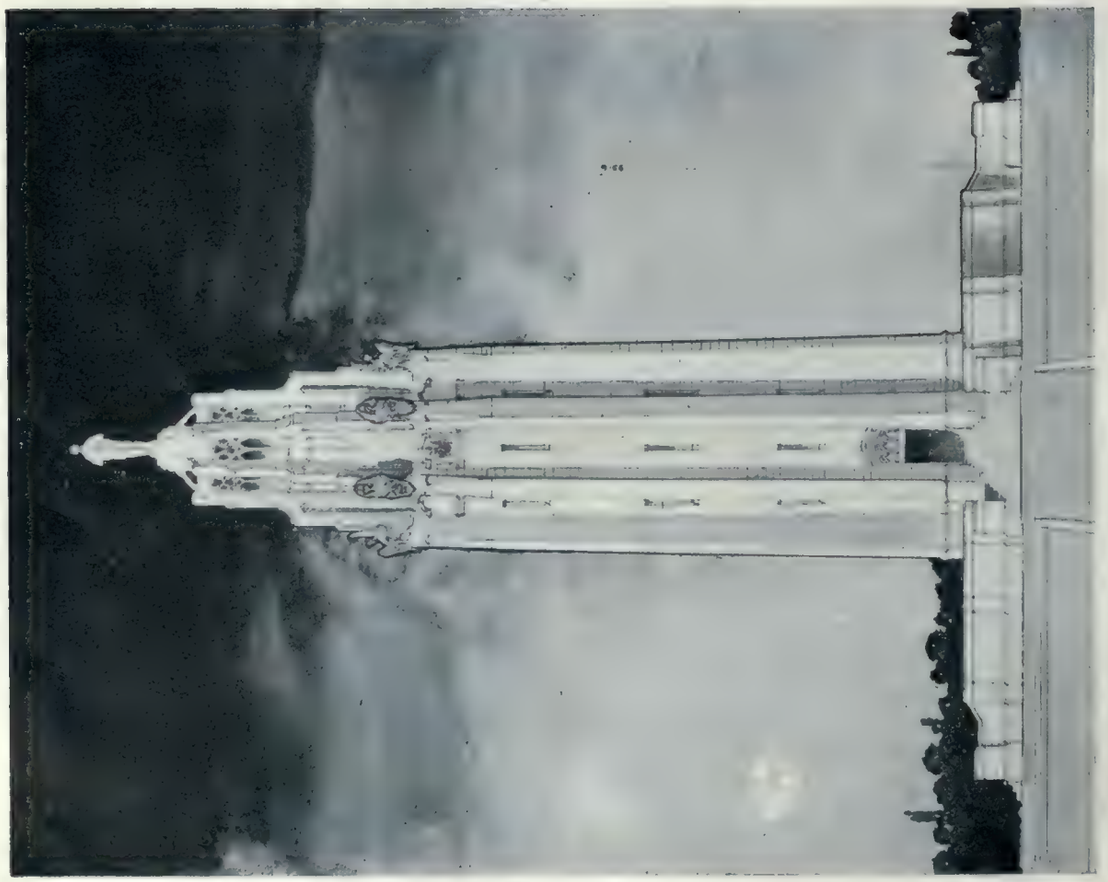
The épisodes of four years in a three hundred mile zone of desolation can be very potently memorialized by monuments attached to specific and outstanding incidents. Such an arrangement is expressive of what was endured and accomplished in a very poignant way.

Conditions of Final Competition

Conditions of Final Competition for the selection of designs for Eight (8) Canadian Battlefields



DESIGN BY F. LASSORE

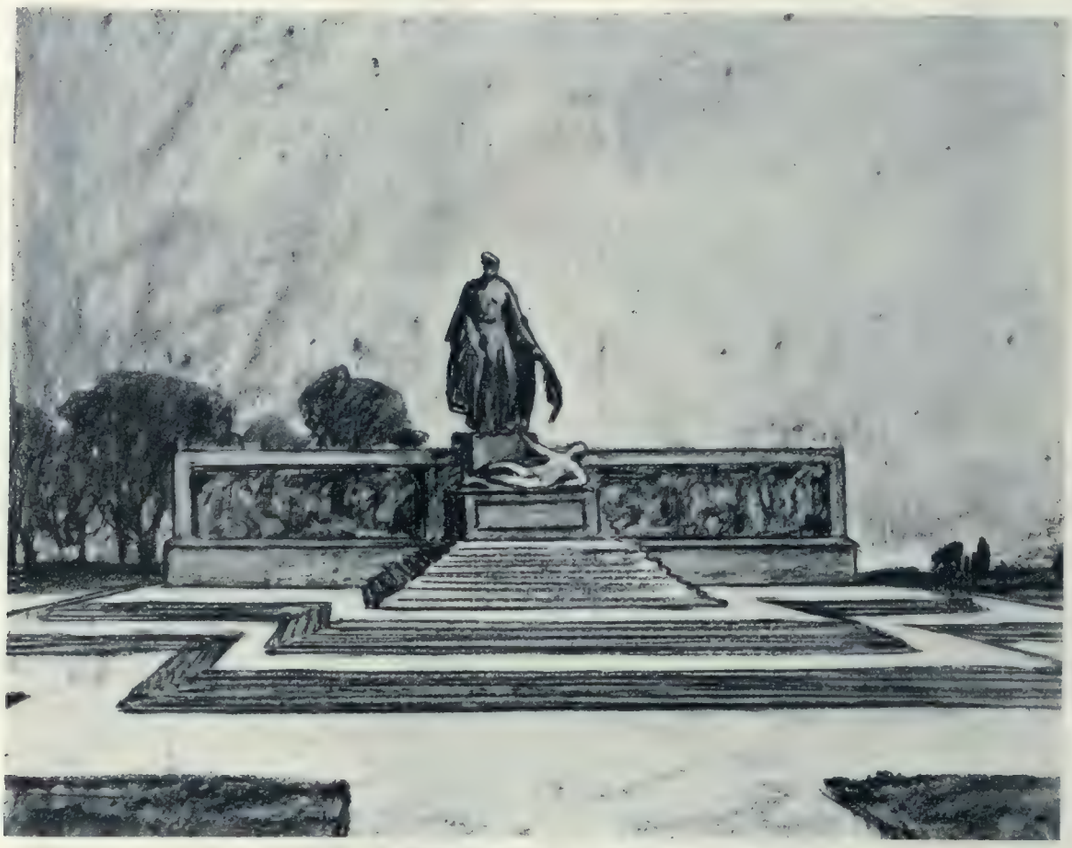


DESIGN BY R. T. PERRY.

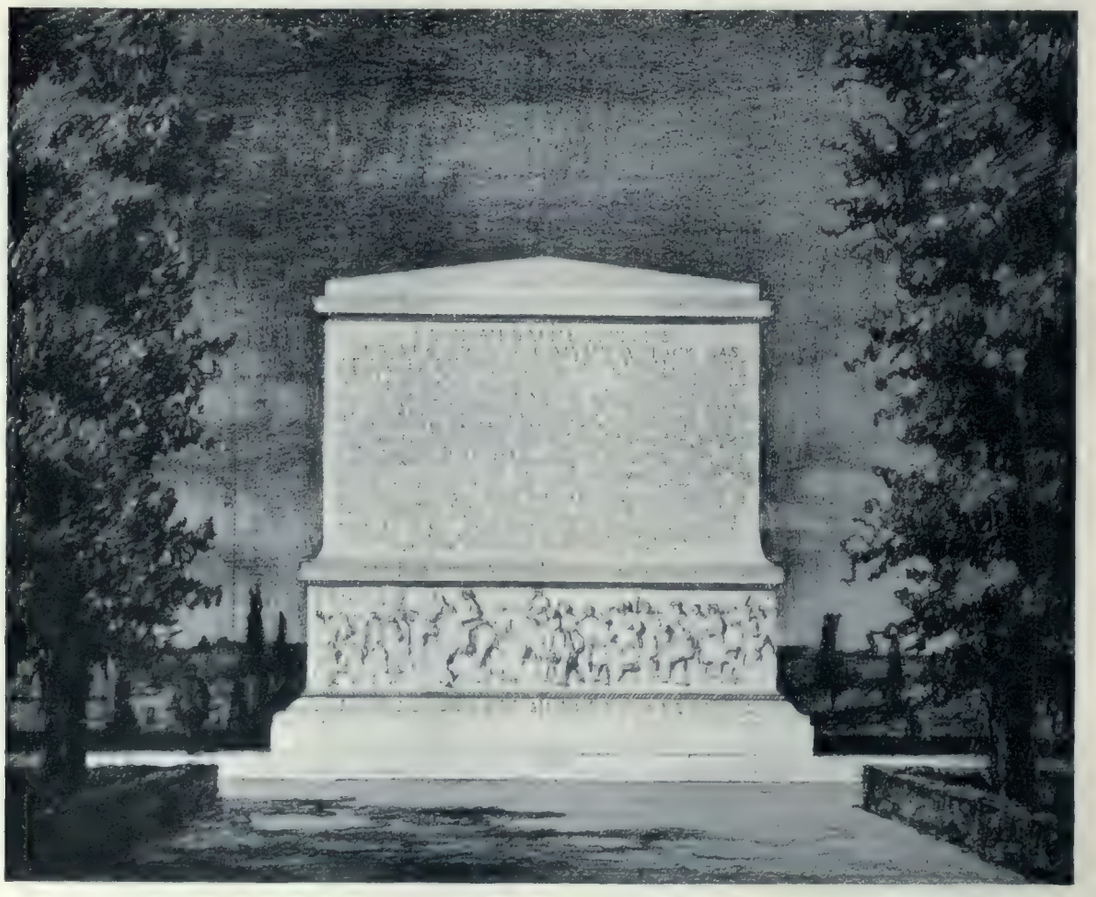
CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

DESIGN BY P. R. WILSON.

DESIGN BY DOMVILLE & HUSBAND
CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

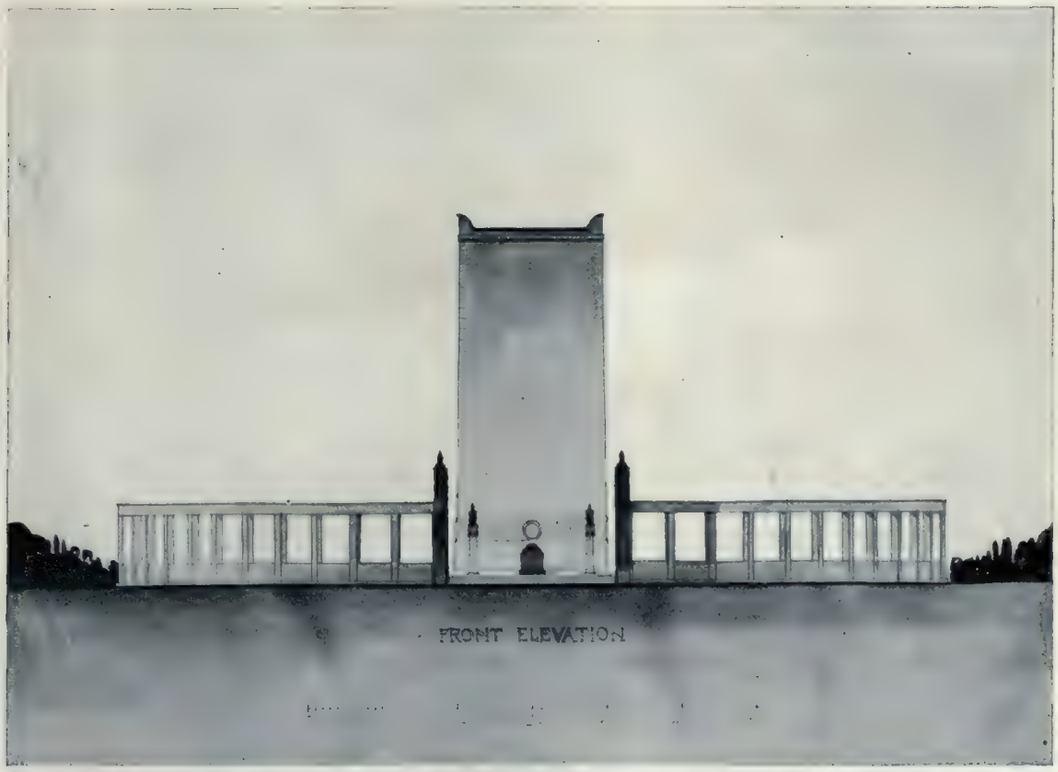


DESIGN BY GEORGE E. TREMBLAY.



DESIGN BY KENNETH E. RAE

CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

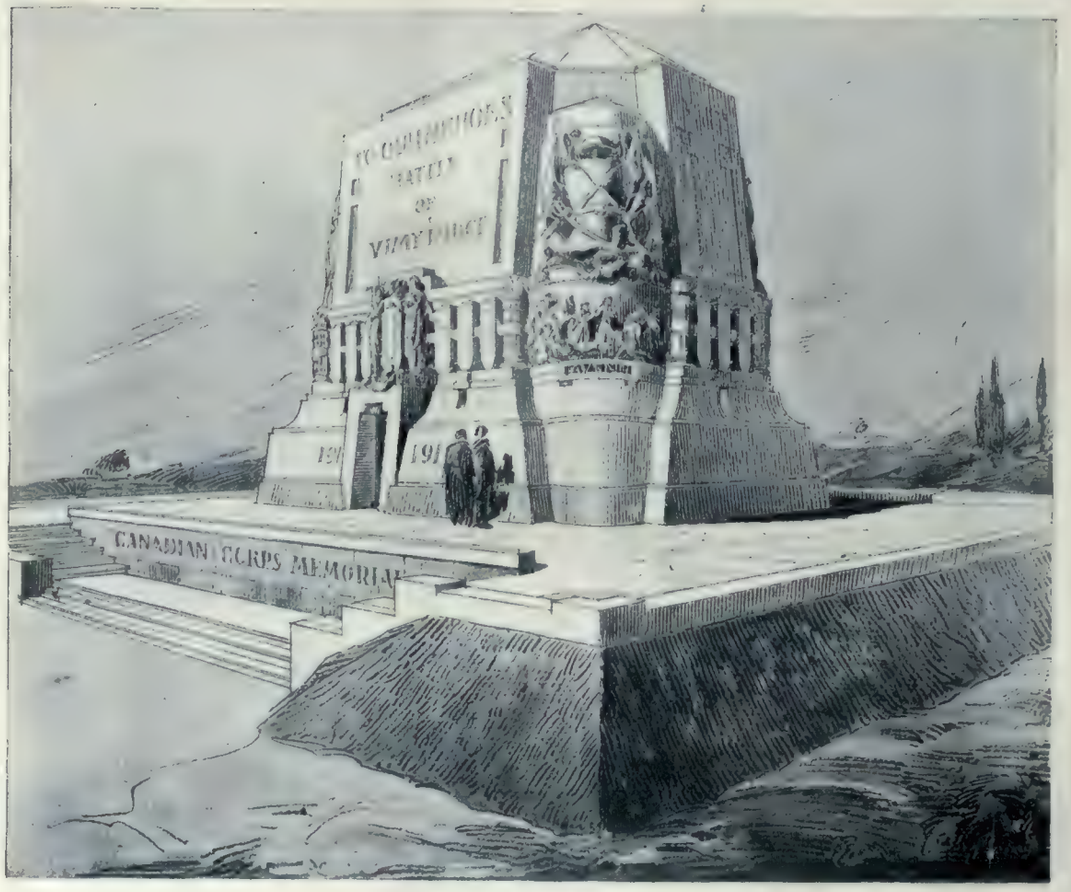


DESIGN BY RAMSAY TRAQUAIR.

DESIGN BY W. A. AND C. A. GAGNON.

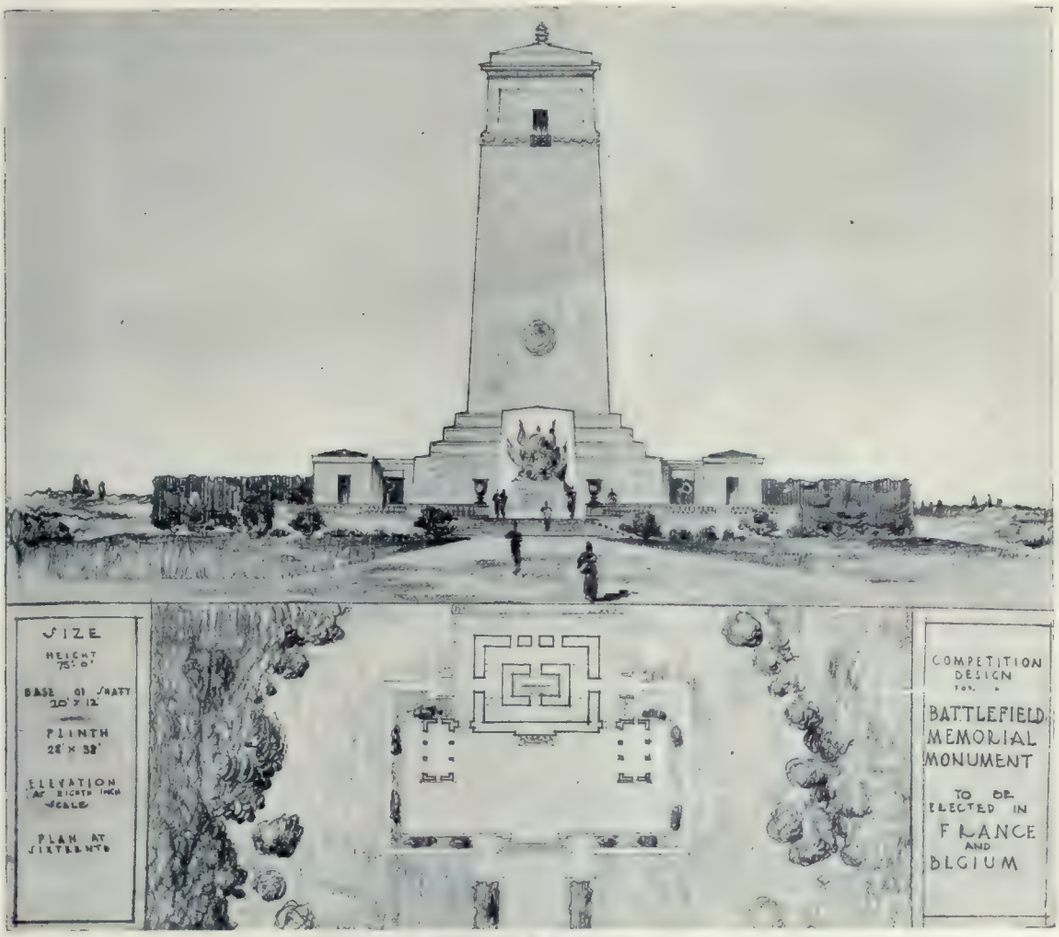
CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

DESIGN BY CECIL BURGESS.



DESIGN BY J. EMILE VANIER

CANADIAN BATTLEFIELDS MEMORIALS COMPETITION



DESIGN BY S. D. RITCHIE

DESIGN BY CHARLES S. COBB

CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

DESIGN BY G. W. HILL
CANADIAN BATTLEFIELDS MEMORIALS COMPETITION

Memorial Monuments in France and Belgium are as follows:

TERMS OF THE COMPETITION

1. The Federal Government of Canada promotes the Competition.

2. The Canadian Battlefields Memorial Commission represents the Government herein and is hereinafter referred to as "the Commission".

3. The professional assessors will be:

Mr. Frank Darling, L.L.D., F.R.I.B.A., R.C.A., representing the Royal Architectural Institute of Canada.

M. Paul P. Cret, Sc.D., S.A.D.G., representing the Société Centrale des Architectes (Paris).

Professor C. H. Reilly, C.B.E., M.A., F.R.I.B.A., representing the Royal Institute of British Architects (London).

The Architectural Adviser of the commission is Mr. Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A.

4. The Competition is restricted to the competitors who have been selected in the preliminary competition.

5. The Commission agrees to accept the award of the professional assessors, provided they are not thereby required to carry out any design which fails to meet the spirit of the conditions as herein set forth. The architectural adviser is responsible for the preparation of these conditions. The award will be submitted to the Governor-General in Council for approval.

The assessors shall come to a decision within twenty-one [21] days after the date for receiving models and drawings. No assessor may be associated with a competitor in the carrying out of the work.

6. The prizes in this Final Competition are the commissions to design one or more of the eight monuments required. At the discretion of the assessors as many as eight [8] designers may be selected for the eight [8] monuments. On the other hand, they may recommend that the whole of the monuments required be entrusted to one designer. In this case a sum not exceeding seven thousand dollars [$7,000] will be recommended for equal distribution among the authors of specially meritorious designs. In the event of any competitor being entrusted with more than one monument to design, his remuneration will be arranged for upon a sliding scale. The assessors may make a recommendation regarding allocation of sites among competitors.

7. The submission of models and drawings required in this competition shall signify the acceptance of all the conditions as herein set forth.

8. Competitors will, on undertaking to compete again, each receive the sum of five hundred dollars ($500) towards the cost of the preparation of models.

PREPARATION AND DELIVERY OF WORK SUBMITTED.

9. Models shall be to the scale of ½-inch equals 1 foot and shall present the principal element of the design with its immediate surroundings (say 100-foot radius). The models, whether constructed in plaster or in wood, should be white throughout. One model only will be submitted by each competitor.

10. Competitors finding difficulty in arranging for the construction of their models may refer to the architectural adviser regarding addresses of model-makers.

11. A set of drawings consisting of a block plan showing the main landscape layout to a scale of 1-64 inch equals 1-foot, with a section and an elevation of the architectural portion to a scale of ⅛ inch equals 1 foot, should also be submitted. These drawings will illustrate the treatment of the complete area of the site as mentioned in clause 17. The drawings may be finished in any style or medium, but will be delivered unmounted, folded if necessary (not rolled).

12. The models and drawings will be signed by the authors in legible lettering.

13. Any infringement of these regulations may, at the discretion of the assessors, be held sufficient ground for the exclusion from the competition of work submitted.

14. All questions asked by competitors must be addressed to the Secretary, Canadian Battlefields Memorials Commission, Militia Department, Ottawa, not later than the first day of June, 1921. All such answers as the architectural adviser may give, together with copies of all questions asked, will be mailed to each competitor within fourteen days' time.

15. All models and drawings shall be sent to the Secretary, Canadian Battlefields Memorials Commission, National Gallery, Ottawa (C.O.D. if sent by Express) on or before the fifth day of September, 1921.

16. The models will be exhibited at Ottawa for one week as soon as possible after the award. Exhibitions may be held in other cities at the discretion of the Commission, for a period of six months. At the close of the exhibition, or exhibitions, the models by unsuccessful competitors will be immediately returned to them. The models by successful competitors will remain the property of the Government.

SITE, CHARACTER OF DESIGN AND COST.

17. To facilitate comparison between the designs to be submitted, competitors are required to work with particular reference to Site No. 1, St. Julien near Ypres. This site may be assumed to be flat.

18. With a view to giving an equal advantage to those competitors who may not be able to see the exhibition of drawings submitted in the preliminary competition, all designs submitted by the successful competitors in the preliminary competition will be reproduced and copies will be furnished to all competitors in the final competition.

19. Landscape work including avenues and groves is contemplated in connection with the sites and work of this character should be indicated on the block plan. Competitors are reminded of the great scale of the natural landscape in France and Belgium.

20. The aim of the Commission is the erection of a series of monuments having a cumulative effect due to repetition of general silhouette. Their value as landmarks is to be kept in view. The Canadian monuments should be readily recognizable as a widely distributed group among the many and varied monuments to be erected in France.

The preliminary competition has been the means of selecting those men who, in the opinion of the assessors, are best qualified for consideration as designers for the monuments.

The following modifications of the original requirements (see preliminary conditions) emerge from the solutions offered:

(a) The height should be between eighty and one hundred feet more or less.

(b) Each monument might with advantage include an observation post allowing a better view of the battlefields than can be had from the ground. A permanent map may be a part of the observation post.

(c) The design of sculpture and the treatment of mouldings, etc., ought to be bold in view of the large open spaces surrounding.

(d) The construction ought to be monumentally permanent.

(e) The precincts should be broadly treated; museums, offices, caretaker's quarters and shelters, etc., are not recommended in view of cost of upkeep.

(f) Competitors are reminded that the use of bronze in monuments of this nature, intended to last for centuries, is open to the objection that it is liable to pillage in case of war. Bronze sculpture and adornments, while not inadmissible, should be used with reserve.

21. The sum available for each monument exclusive of landscape work is one hundred and twenty thousand dollars ($120,000), and competitors may assume for the purpose of the competition that the cost of building will be half as much as in Canada at current rates.

CARRYING OUT THE WORK.

22. The work on the Monuments in France and Belgium will be carried out by the Commission from the specifications, contract and working detail drawings prepared by the successful competitor or competitors. Before calling for tenders these drawings and specifications will be submitted for the approval of the Commission.

In case the above instruments of service are inadequate the Commission may require their revision.

Should the lowest tender or estimate obtained by the Commission exceed the sum available, the competitor or competitors will be required to revise the design and amend specifications and drawings as necessary.

23. The successful competitor or competitors will be required to visit the site or sites allocated to them before completing the working drawings. The out-of-pocket expenses for these visits will be found by the Commission.

24. For the specifications and the contract and working detail drawings and time expended on the visit, a successful competitor entrusted with a monument to design will receive remuneration at the rate of 7 per cent. on the ascertained cost of the work above ground level, the superintendence of construction being provided for by the Commission.

25. In the case of successful competitors who are sculptors, or artists other than architects, the preparation of the specifications and drawings for the embodiment of their ideas must be entrusted to architects named by themselves, but approved by the Commission, and the cost of such architectural assistance will be borne by themselves out of the remuneration as provided for in clause 24.

26. The successful competitor or competitors will obtain sculptor's estimates for models (both statuary and decorative) and insert provisional contract sums in the specifications to cover the cost of this part of the work. They will submit the names of the sculptors they propose to employ, for the approval of the Commission.

In the case of a successful competitor for the designing of a monument being a sculptor and desirous of carrying out the sculpture himself, he must submit to the Commission satisfactory evidence of his competence as a sculptor. If accepted, a separate contract for this part of the work will be made with him.

27. Upon the approval of the final award by the Governor-General in Council, the Commission will furnish to the successful competitor or competitors the necessary practical data regarding such matters as surveys, foundations, materials, cost of various kinds of labor, and such other information as will enable them to proceed with the preparation of working drawings.

28. Should the scheme be postponed over a year or for any unforeseen reason be abandoned, the successful competitor or competitors will each receive the sum of two thousand five hundred dollars ($2,500) as a payment on account or a solatium.

Building Materials and Research Work

By Alan E. Mumby

Paper read before the Royal Institute of British Architects.

A RESEARCH problem generally has two ends, and these often belong to different professional or commercial spheres. Hence, in many cases much advantage would result by collaboration. As an example, many defects in materials arise from injurious atmospheric influences, and an attack should be made simultaneously on improvement of materials to resist such influences and on the reduction of the impurities in the air which are deleterious. Obviously co-operation between these two sets of workers would be valuable, as the possible improvements on either side must necessarily be closely related.

The utility of research is well exemplified by the extraordinary improvements in certain materials, the result of rigid demands by engineers. Steel, which can now be obtained of uniformly high quality suitable for a great variety of purposes by making very trifling but all important changes in composition, is an obvious instance. Cement, which we can now so comfortably specify as having to conform to a standard specification, is another striking example. The high and certain qualities obtainable in these materials is the result of patient research stimulated by demand. If we could purchase our materials on the basis of the essential qualities we wish them to possess, stimulus to improvement would be vastly increased. Suppose, for example, that we bought cement by strength and paint by durability, instead of by the more primitive standard of weight, in which we are not the least interested, and which attribute is indeed an incumbrance, how much material of poor quality which masquerades as "best" would disappear from the market, and how the best would improve merely for commercial gain. Such form of purchase may not at present be practicable in many cases, but we should keep this point of view in front of us.

It is to be feared that our supineness on certain small matters which could easily be rectified by more rigid demands often leads to troubles quite disproportionate to their initial causes. May I cite one instance? We are constantly troubled with cases of dry-rot in timber, and in those which have come under my notice quite half are due to defective rainwater pipes. Now, the ordinary rainwater pipe is so cast that it is usually thinner at the back than in front, hence its vulnerable unpainted side readily perishes and the pipe leaks against the wall, the defect being often undiscovered until some dormant spores wakened into life by moisture begin their ravages upon the ends of joists or other internal timber. Were these pipes more rigidly specified the immediate result would no doubt be trouble, delay and increased cost, but this might be got over by giving notice in advance of a standard to be required, and very soon defective goods would be ruled out of reputable work with great national saving.

It is quite impossible on the present occasion to attempt any comprehensive outline of suggestions for specific researches likely to be valuable to architects, the building trade, and building owners; but, lest I be accused of advancing mere vague generalizations, I feel I must mention a few.

LIME.

There is a great deal of work to be done on building lines, which are capable of improvement and are in every way suitable for much work in place of Portland cement with considerable economy.

Before the days of Portland cement all our buildings were erected in lime mortar. The area of the top of the 18-inch brick cone to the dome of St. Paul's is about 150 square feet, and this sustains the cupola, weighing 700 tons; hence the lime mortar joints must be carrying more than 4 tons per square foot, a weight which we should hesitate to place on many walls of modern brickwork. Cement is scientifically manufactured, and made to conform to definite and rigid specifications. The lime industry, on the other hand, is much as it was a hundred years ago. Lime is an inconvenient material to store and handle, and probably with improvement and increased demand could be much cheaper; on the American continent, where the lime industry has made enormous developments in the last twenty years, the burnt stone is hydrated and marketed as a dry hydrated screened powder, which keeps fairly well, does not expand or fire, and carries as much sand in mortar as the unhydrated lump material. At the present time, on actual material only, about £1 a rod for equal condition of transport can be saved by the use of lime in place of cement in brickwork. More important, however, is (or ought to be) the saving in wages in building in lime, as a man can work with it much more rapidly. A bricklayer of 50 years' experience recently questioned put the saving in labor at one-third.

The methods of improving our weaker limes are becoming forgotten. In 1856 a patent was taken out for Scott's cement, formed by the mere addition of a little gypsum to stone lime. Tests are available showing that the strength of mortar can be thereby more than doubled. Street used such mortar in 1878 in building the Law Courts, but I have not found anyone conversant with this material at the present day.

STONE.

Public interest has been lately much aroused on the question of the decay of stone in our national buildings. The disintegrating influences which affect stone in buildings give rise to great expense and trouble, and the remedies employed are by no means always satisfactory. Most freestones take a skin hardness after quarrying, due possibly to the deposition of solid bodies near the surface on the evaporation of the "quarry sap". This skin once removed never seems capable of replacement, and there is always a danger, in applying solutions or chemicals which result in precipitation, of obtaining a skin which by further disintegration becomes detached from the stone, leaving it worse than before. I fear we shall be told that much of our architectural ornament in stone involves the use of material in a manner which can only lead to decay through lodgment of dirt and moisture even in a comparatively innocuous atmosphere. Probably the physical characters of stone are more important than chemical differences in composition. Again, compactness is no criterion of durability; for example, Ketton stone, with its large, rounded grains, weathers in town atmospheres better than some stones more dense in character. The durability of a stone often depends much more on the character of a small percentage of cementing material than on that of its main ingredients. Scientists have yet told us little about the real meaning of adhesion and cohesion, and we seem a long way from any standards by which to measure these important properties.

BRICKS AND TILES.

We are all conversant with the disastrous defects which often occur only after some years in roofing tiles. A careful report is wanted on the conditions of manufacture and an investigation into the subject of shelling, lamination, and the effect of slope angles, and climatic conditions. Why should the old tiles last 150 years, while many modern ones are hardly able to stand a single decade?

The wonderful condition of certain old tiles after a century of wind and weather is ascribed by some to the mellowing of the clay before use. This mellowing can only mean disintegration and chemical changes, including the removal by solution of undesirable ingredients, and there seems no reason why the chemist should not seriously take up this subject with a view to removing the loss and embarrassments resulting from defects in composition. As regards pressed tiles it must be remembered that almost any substance tends to laminate under pressure; even such a homogeneous material as wax will show this effect. It would be interesting to discover whether any relation exists between durability and plasticity, a property much influenced by hydrated oxide of iron and carbonaceous matter as well as by the amount of true clay substance—kaolin. Bricks used in such vast quantities require more attention as regards impurities such as appreciable fragments of lime and objectionable soluble sulphates. The danger of lime in bricks and tiles, of course, arises from the great expansion resulting in the presence of moisture. When in minute fragments the porosity of the material is usually sufficient to admit of this expansion, but when lime is present in pieces of appreciable size cracking or bursting must result. Lime cartridges, indeed, were used before the days of gunpowder for blasting. Fortunately, lime is very easily detected.

The "salting" of bricks again, due largely to sulphate of soda, often has disastrous effects on decorative work, and this efflorescent material may be formed by faulty firing and bad coal even if absent in the original clay.

TIMBER

Timber in its converted condition is a material upon which many researches are urgently needed. Most of our other materials are of mineral origin and their decay is due to oxidation or other chemical reactions which limit the field to the work of the chemist, physicist and mineralogist. Here, however, we have an organic edible substance open to the ravages of insects and fungoid growths. We are all conversant with the defects produced by boring beetles or worm, though the work of these industrious insects is often neglected. Many of our fine old roofs and much hidden structural timber falls a prey to these creatures. More dire and urgent is the terrible scourge of dry-rot caused by the fungus Merulius, which almost amounts to a national plague, much accentuated since the war as the result of the use of sappy and unseasoned timber and the inevitable neglect of property which has often allowed deterioration to extend so far that insufficient protection from weather has resulted. What the annual cost of this pest is it would be unwise to hazard, but I alone have seen probably a dozen cases involving repairs amounting to many thousands of pounds in the last twelve months. Yet we have not a single recent comprehensive volume on the subject in this country and but few workers, and these mostly engaged also on other duties. The mycologist has little regard for the practical side of this problem, while the architect considers it too botanical for his sphere of action, and as far as I am aware our students are taught little or nothing about it. Meanwhile the country suffers while no effort is made to stamp out infection at its source.

Much might be done to check the evil by insisting upon more sanitary conditions at the docks and in our timber yards, where infected wood is often treated with no more care than brick rubbish, and, indeed is sometimes used as a convenient sub-stratum in which to place sound timber. Our Science Committee is making what will, I hope, prove a valuable investigation into the storage conditions of timber, and after the submission of its report to the Council it is to be hoped that, if this course seem justified, this Institute will press for legislation to improve and control conditions of timber storage. Meanwhile we want an organized body of whole-time workers prosecuting researches into the entire subject of diseases in converted timber, and probably few national investments would pay better.

METALS.

In the decay of metals atmospheric impurities play an important part, but moisture and carbonic acid, which must be regarded as normal constituents, are responsible for decay apart from aggravating additions such as sulphuric acid found in most town airs. Attention has recently been directed to the preventive or inhibiting action of certain substances as, for example, lime protecting iron in concrete. Again, we have new certain steels which resist corrosion owing to the presence of small quantities of vanadium. Most commercial metals are really alloys and a great deal has yet to be learnt on the composition of alloys relative to resistance to corrosion. The discovery of a metal strong enough for structural work and cheap enough for use which will resist atmospheric corrosion and therefore will not require the services of the painter does not seem an impossibility, and such a discovery would be worth many years of well-paid research work. Even if an alloy research failed some skin treatment at the time of manufacture might prove effective. I have an ingot of copper clothed permanently with that beautiful red oxide temporarily produced on clean copper by a London fog. This has had quite a chequered career in my possession for 30 years, but its surface remains clean as it came from the mould. The decay of zinc is really a very serious matter for owners of small town property and probably depends in a great measure on impurities in the metal. There is no special difficulty in preparing pure zinc, nor should it, I think, be prohibitive in cost. It would be a comparatively simple matter to produce cost and durability statistics for various qualities of this metal.

PAINTS.

Paints and varnishes, perhaps the most difficult of materials to assess, need more experimental work. For example, experiments made some years ago showed that in two similar paints the sizes of the solid particles were respectively 125 and 2,500 to the linear inch, and that the latter had twice the durability of the former. Oxide of iron paints in oil varies in price more than 50 per cent., according to quality, but very slender means exist for ensuring that we get the best when we demand it.

The solid body matter in a paint possibly bears some resemblance to the aggregate in a concrete, the oil acting as a vehicle and binding material, and if we want our paints to resist weather it does not seem unreasonable to use our experience of concrete as an analogy. It has been proved that aggregates to resist moistures must be composed of particles of varied size, and it seems not unlikely that this would prove true of paint bases. Moreover, varied size in aggregate particles makes for greater strength. A thin elastic film of dried oil may not be comparable with crystallized lime, but there are some who hold that even the setting of cement is entirely due to colloidal or gluelike bodies.

The different materials used in the paint trade, including the vast number of pigments, do not number much less than a thousand. Among the 150 pigments in common use about 17 per cent. are liable to fade, and this is a subject worthy of investigation. The nature of the gums and resins, a most difficult subject, is yet imperfectly understood, and varnishes which are made from these resins are open to much adulteration. The recent use of substances of vegetable origin dissolved in organic liquids—for example, the so-called cellulose acetate—suggests that our organic chemists might help in finding substitutes

(Concluded on page 185)

EXTERIOR VIEW.
RAWLINSON SCHOOL, TORONTO.
D. R. FRANKLIN, ARCHITECT.

Rawlinson School, Toronto

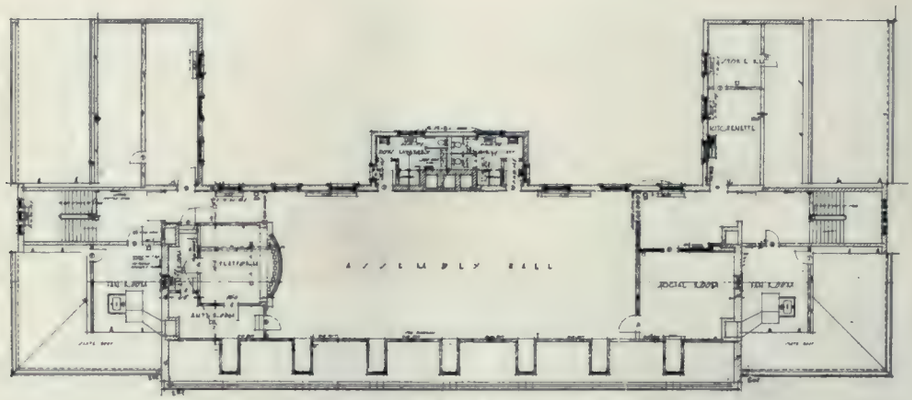
By a Visitor

BY WAY of introducing the writer of the following article it may be said that for many years he has been very much interested in children and in everything pertaining to their welfare. When still in his twenties he was deeply impressed by the needs of children whose parents had not been favoured financially and accordingly set out alone to visit their homes and succeeded in gathering around him a class of over one hundred children.

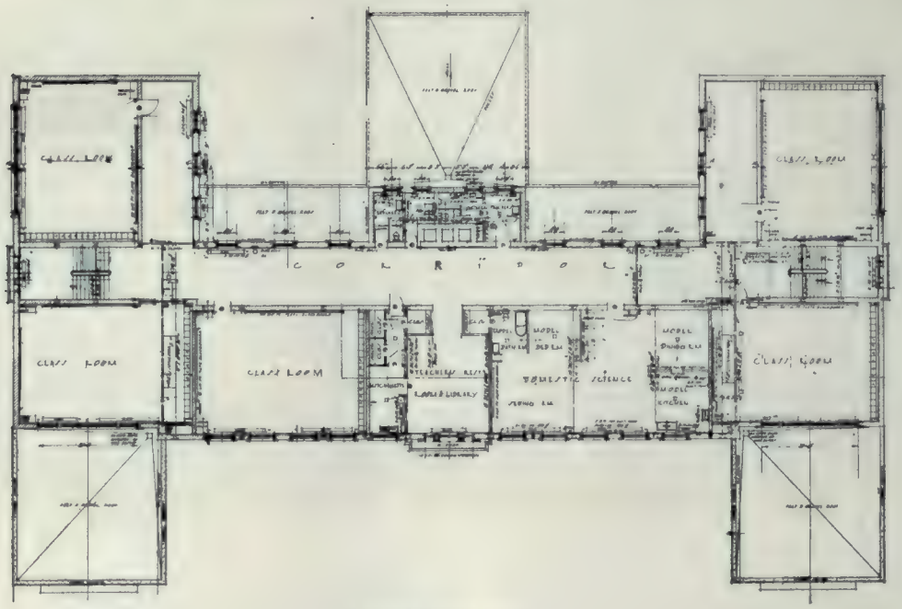
While engaged in this work he made it his business to seek out the children from the humblest homes he could find and in doing so had ample opportunity to observe the influence of environment upon the child. And while it is not the intention here to picture any of the scenes which memory recalls it may be said in passing that the conditions of child life were not infrequently a crime against civilization, not to speak of Christianity.

Since that time the writer had travelled thousands of miles by land and sea, in England, Africa, the United States and Canada, and his work has been closely connected with children and their welfare It was, therefore, a pleasure during his present stay in Toronto, after making interesting visits to a large number of city schools, to be asked to visit the Rawlinson School and to give his impressions thereof, as he was informed that this school was somewhat different from the usual type.

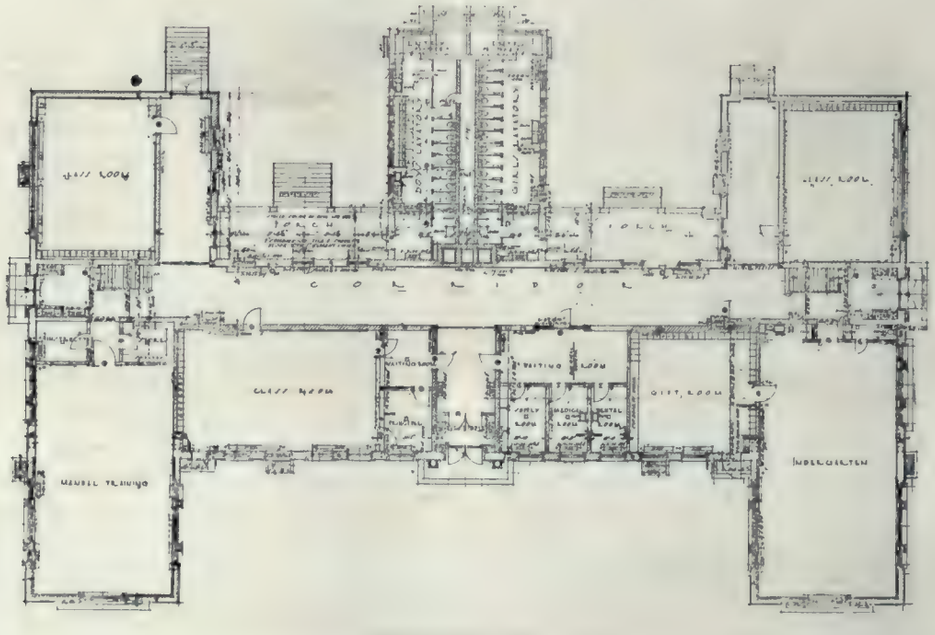
This school is located at the corner of Glenholme and Earnscliffe Avenues, about half a mile north of St. Clair Avenue. The first impression, viewing the building from Oakwood Avenue, is that of a magnificient residence. Standing on a site of some five or six acres, with beautifully terraced lawns on the front and west, solid concrete foundations rising above the ground, cream colored stucco walls with pure white cornice and trimmings, it serves to remind one of a very large old English mansion. It is certainly a radical change from the type of school one usually finds, and he was certainly a bold architect who introduced a design of this character. Architecturally it achieves a standard which might well be further emulated, both in Toronto and elsewhere,



UPPER FLOOR PLAN.



SECOND FLOOR PLAN.



GROUND FLOOR PLAN.

TYPICAL ARRANGEMENT OF RAWLINSON AND JOHN ROSS ROBERTSON SCHOOLS, TORONTO.

D. R. FRANKLIN, ARCHITECT.

EXTERIOR VIEW.

NOTE—The class rooms of both the John Ross Robertson and Rawlinson Schools illustrated in this issue are typical.

TYPICAL CLASSROOM.

JOHN ROSS ROBERTSON SCHOOL, TORONTO.

D. R. FRANKLIN, ARCHITECT.

KINDERGARTEN ROOM.

DOMESTIC SCIENCE ROOM.

JOHN ROSS ROBERTSON SCHOOL, TORONTO.

D. R. FRANKLIN, ARCHITECT.

for it creates an environment which leaves little to be desired.

In the days of the writer's childhood the school was regarded by him as a sort of a penal institution, a place to which he would be compelled to go and where he would be compelled to study, and woe betide him if he did not. Everything was to be done by compulsion, thus making it a place to be dreaded. But here how different. Everything in the scheme is well organized and attractive, and in the opinion of the writer this is as it should be, for once a child is attracted to school and his work made interesting, the rest is comparatively easy. One cannot but reflect how vastly different is the opportunity afforded the children who are privileged to attend this school from that of the one hundred or

ASSEMBLY HALL.

D. R. FRANKLIN, ARCHITECT.

JOHN ROSS ROBERTSON SCHOOL, TORONTO

TEACHERS' ROOM.

more who constituted his class many years ago.

On entering the building by the main approach, one finds oneself in the spacious centre corridor, where an air of quiet dignity, so evident in the scheme throughout, prevails; the stuccoed walls with painted dadoes, mahogany slab doors and simple trim finished in grey enamel, all resulting in a harmonious treatment. On the left are the Principal's office and waiting rooms, adjoining the Principal's class room; while on the right are the medical and dental inspection offices with a commodious waiting room and a supply room for general school supplies.

One feature noted was that a child on entering school for the first time, or who has been absent on account of sickness and is returning to school, can be medically examined before coming into contact with the other children. This is of vital importance, and although not altogether a new feature in modern buildings of this type, it is one lacking in many schools visited. The inspection rooms, as well as the Principal's office, are convenient to the entrance and are easily accessible.

A few steps brings one to the main corridor which runs east and west. This extends the full length of the building with exits at either end, together with staircases leading to the floors above. The perfect stillness of the corridor justifies a word of comment, and is due to the character of construction employed. The walls are fireproofed with hollow tile, and the floors are of concrete and hollow tile with cement finish overlaid with battleship linoleum glued down to the cement. This together with well-fitting doors renders the corridors practically soundproof. The stairs are also fireproof, being of reinforced concrete construction with slate treads and having neat iron balustrades and wood handrails. There are also corridors running north at each end of the main corridor, provision being made for future extensions of the building in this direction.

It will be noted in the accompanying plan that in addition to the Principal's office, waiting room and medical and dental inspection rooms, there are three class rooms, a kindergarten room and a manual training room on the first floor. The kindergarten room by a happy thought has been located at the southeast corner of the building. This is beyond question the brightest kindergarten room the writer has yet visited anywhere in his travels. With large folding glass doors on all exterior walls and an almost superabundance of light, it gets the full benefit of the sun throughout the day on the east, south and west.

Adjoining the kindergarten room is the gift room, about twenty-five feet square, in which are lockers for children's cloaks and cupboards for kindergarten supplies, etc.

The manual training room is similar to the kindergarten room with plenty of light, and has an instructor's room and suitable store room ensuite. The class rooms are all provided with wardrobe lockers and individual moveable desks for pupils.

Five additional class rooms are provided on the second floor, together with a domestic science room, a teacher's rest and lunch room and kitchenette. The domestic science room is fitted up in accordance to the most modern ideas, having kitchen, dining room, bedroom and sewing room all suitably furnished, and also a supply room and ample cupboard accommodation.

By far the most interesting feature of the plan is the arrangement of the upper floor. Here a spacious and well-lighted assembly hall, with a large platform at one end raised well above the floor level, and a modern fireproof moving-picture booth at the other, suggests possibilities which have hitherto been the dream of educationists. On the north side of this hall are located boys and girls shower baths, which can be used in conjunction with drill work and gymnastic exercises.

Adjoining the assembly hall is the "community room" with kitchenette and store room attached. This room is well entitled to be called the "heart" of the school. If one could go back to the time when the building was merely a conception in the architect's mind, and as it were to view that conception under the power of the X-ray, it would be found that he aimed at building a school where every facility would be afforded to develope a spirit of co-operation and good-will between teachers, pupils and parents, a spirit which would immensely lighten the burden of the teacher and result in lasting benefit to all concerned.

It would doubtless be found, too, that he had in view a centre where local problems could be discussed, problems outside the range of the school curriculum, but of vital importance to the well-being of the community, and also a communal centre for social intercourse and fellowship. For such purpose as this the community room is admirably suited.

Viewed from this standpoint, the writer can understand why the architect has been careful to produce a design so attractive and noteworthy, so well organized in plan and pleasing in color harmony. The exterior of the building is devoid of everything that is forbidding or repellant, and clothed as far as possible with the attractive appearance of a residence.

The heating and ventilating system of this school has also been carefully worked out. The boiler room is not under, but is entirely outside and adjoining the main building at the rear, the greater part of it being underground, only the small windows for lighting purposes appearing above the grade. Here a large tubular boiler set in brickwork is heated by two jets of a modern fuel oil burner, and it is claimed that even in very cold weather steam can be generated sufficient to heat the building in a comparatively short time. One cannot but be impressed with the absolute cleanness of everything, no coal bin, no ashes nor dust. The oil is drawn from a large storage tank located in the yard, which in turn is refilled when required by a pipe carried out to the street line. Everything in the boiler room has been most carefully considered to obtain the highest degree of fire protection.

The radiators throughout the building are of the hospital type carried on wall brackets and kept well above the floor to facilitate sweeping underneath.

The ventilating system is simplicity itself. Fresh air is admitted to the class rooms by raising the windows slightly; this allows the air to enter both at the sills and the meeting rails, strips being secured to the sills to deflect the air upwards, thus distributing the inflow without occasioning any drafts.

On the second floor are two fans which by steady, gentle suction draws the vitiated air from the class rooms, not at a fixed point, but through small apertures in each locker door right across the full width of the class room. With the outlet thus distributed the possibility of any child sitting in an atmosphere of vitiated air is entirely obviated.

A suitable room with lavatory and shower bath, and private entrance is provided at the rear of the building for the caretaker. The boys' and girls' lavatories are situated on the first floor over the boiler room.

In addition to being of fire-resisting construction, additional means of safeguarding the building from fire have been provided in event of any contingency arising from that source. On each floor near the staircase is a hose cabinet with a long length of hose attached ready for instant use at any time. These hose lines protect the exits but are sufficiently long to meet in the centre of the building with a powerful stream of water. In addition to this, chemical fire-fighting apparatus, also ready for instant use, has been provided in case of any small local fire.

The school being in session during the writer's visit, he had the opportunity of witnessing with admiration the excellent discipline and order which prevails. The large number of tiny tot making their way into the kindergarten room carefully shepherded in small groups by senior boys and girls, who evidently took a real pleasure in this work, especially appealed to him. With such an excellent staff in charge of the school, principal and teachers working so harmoniously together, and the genial caretaker who keeps the building so scrupulously clean, and, whose courtesy the writer will ever hold in grateful remembrance, the future of this school is fully assured.

Quebec Chief Source of World's Supply of Asbestos

Asbestos is one of the better known of Canada's non-metallic minerals. It is useful as an insulating material and enters into the production of many every-day appliances. It is found chiefly in the Eastern Townships of Quebec, the deposits there being the chief source of the world's supply. Asbestos is a fine, flexible fibre, of silky appearance. It occurs in the fissures of the serpentine rock, which in this area is of a dark green or brownish colour, so badly shattered that it is almost impossible to secure a block of the stone six feet long. Veins of asbestos, sometimes from four to five inches in thickness, are found with the fibres at right angles to the walls of veins.

Properly speaking, asbestos is not mined, but is recovered by the open-cut method from quarries similar to stone quarrying. The over-burden is removed by steam-shovels.

Owing to its non-conducting properties and to the fact that it is resistant to common acids, asbestos has many and varied uses. It is largely used as insulation for heating plants and of refrigeration installations. Asbestos enters largely into the manufacture of electrical equipment, such as electric irons, toasters, fuse boxes, switchboards, etc. Other purposes for which it is used are as wallboard, sheeting under shingles for fire prevention as gas logs in fireplaces, as filament for kerosene and gas mantels; and as table mats and utensil holders.

The motor car industry has become a large consumer of asbestos, for insulation purposes and for brake linings, etc.

Owing to the facility with which asbestos fibre can be spun and woven, considerable use is made of it for filtering purposes in laboratories. Its resistance to the common acids renders it of special value for this purpose.

The production of asbestos in the Province of Quebec in 1920 amounted to 177,605 tons, of a value of $14,674,372. By far the greater proportion of this is exported, mostly to the United States.

Canada's Fire Loss

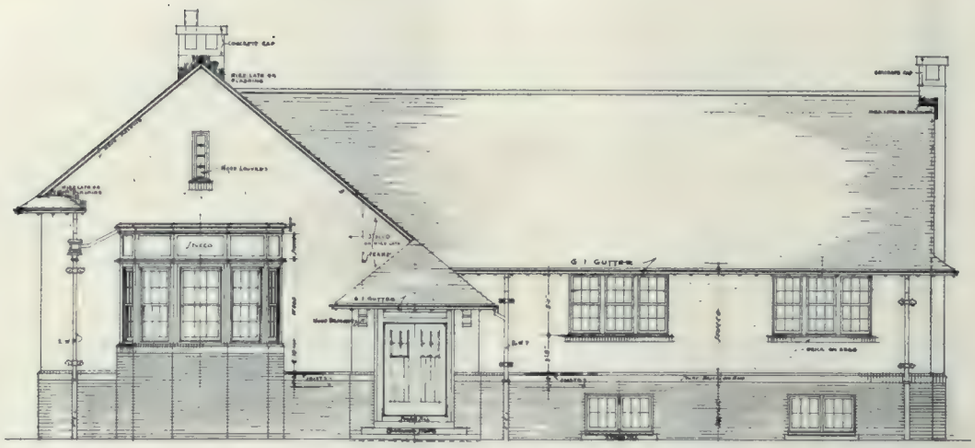
The fire loss on buildings and contents for first quarter of 1921, amounted to $7,085,600, equal to $55 per minute, or $872,000 more than for the same period of 1920.

Canada is passing through a season of business depression; the demand on all sides is for the exercise of economy, not only in private life but in public affairs. Parliament is critically surveying every item of the national budget for possible reductions. The estimates call for the largest sum Canada has ever been required to raise, over $565,000,000, and yet, large as this sum is, the Minister of Finance could go into the open market and borrow the money at approximately the same cost for interest as is represented in our annual fire waste.

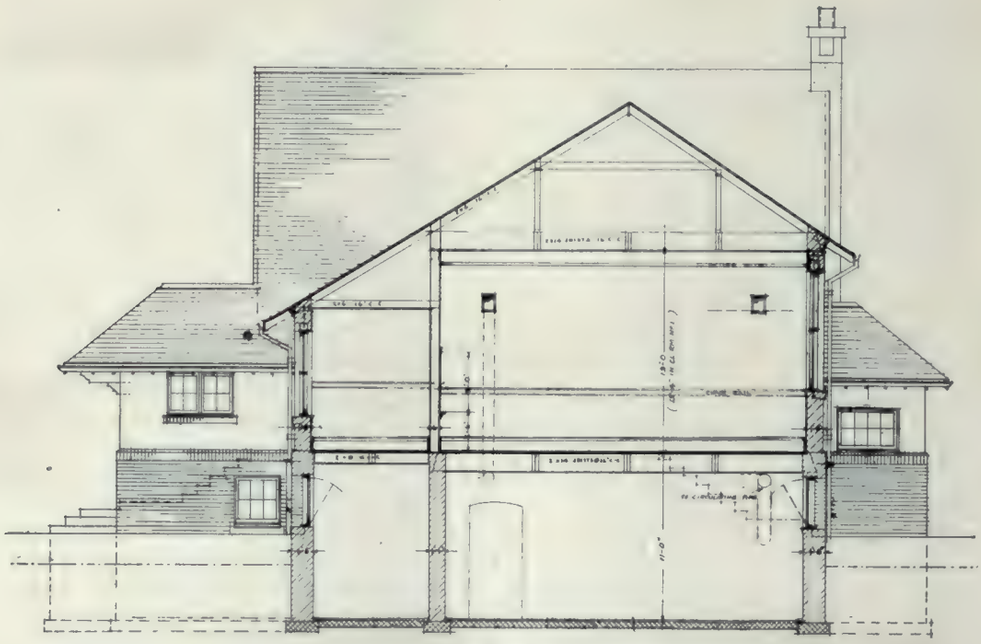
Unfortunately, there is little indication of a reduction in the fire loss; to much the larger portion of fire sufferers the loss is made easy by the fact that it is covered by insurance, while this same condition tends to make the general public callous of the fire danger.

Obituary

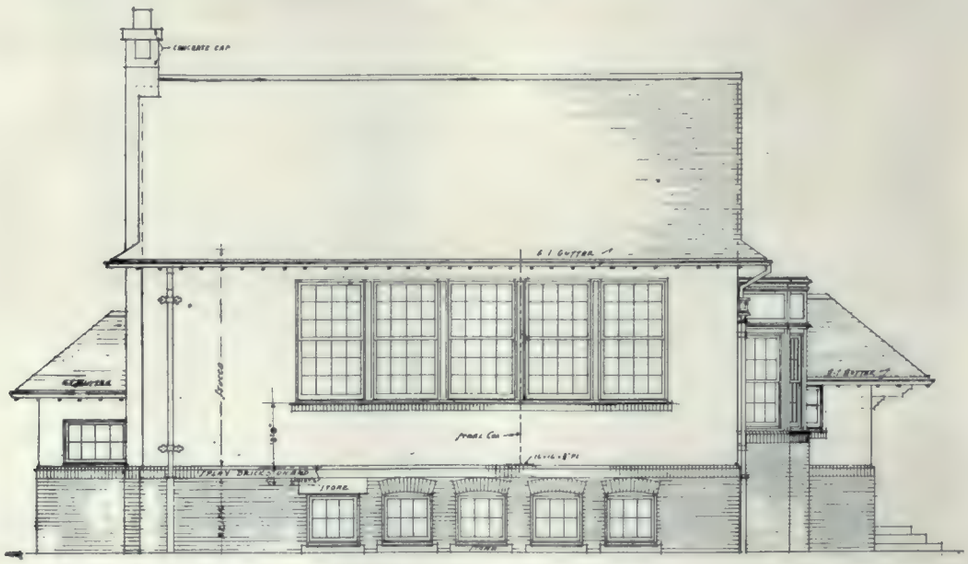
David Ewart, for many years chief architect of the Federal Department of Public Works, died at his home in Ottawa on June 7th, at the age of eighty years. Deceased was born in Scotland and first entered the Public Works Department fifty years ago.



FRONT ELEVATION



CROSS SECTION



END ELEVATION

SMALL SCHOOL, OAKVILLE, ONTARIO.

MOLESWORTH, WEST AND SECORD, ARCHITECTS.

EXTERIOR VIEW.
SMALL SCHOOL, OAKVILLE, ONT.
MOLESWORTH, WEST AND SECORD, ARCHITECTS.

Small School, Oakville, Ontario.

The small school at Oakville illustrated in this number represents an effort to get away from the stereotyped red brick school with galvanized iron cornices. The architects felt that Oakville, being an essentially residential town of the better class, some attempt should be made to provide a school in keeping with the conditions. They have endeavored to provide a building which will have a different atmosphere from the usual public school, being less formidable in appearance to primary grade children for whose use it was planned. The domestic appearance is also more in keeping with the neighborhood in which it is placed.

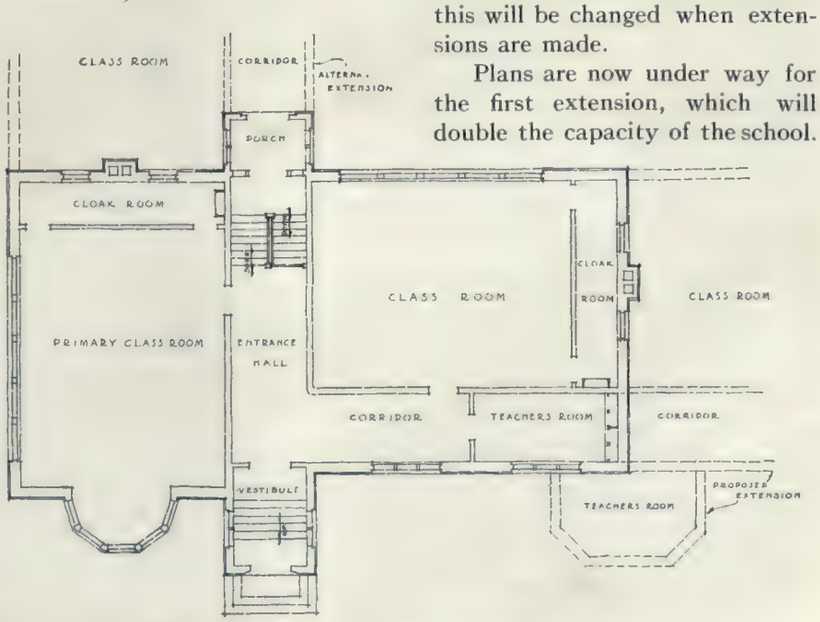
The plan is capable of extension, first by duplication sideways to four rooms, then upwards to eight rooms and if further extension is required it can be made to the rear.

The present structure has been built to carry an additional floor, and is so arranged that the necessary stairs, etc., can easily be installed.

The large bay window on the front provides a very useful place for the sand table in the room used for kindergarten primary work and adds considerably to the appearance of the school.

Above the ground floor the wall construction is hollow tile, stuccoed on the exterior. The basement is of brick. The heating at present is by hot air, but this will be changed when extensions are made.

Plans are now under way for the first extension, which will double the capacity of the school.



FIRST FLOOR PLAN.

O. A. A. Notes

A MEETING of the Council of the Ontario Association of Architects in the Lecture Room, 96 King Street West, Toronto, on May 7th, with President Moore in the chair, and the following members present: Messrs. Hynes, McGriffin, Page, Watt, West and Wickson.

After confirming the minutes of the previous meeting, the matter of a Standard Form of Contract for the Dominion was discussed, and the following conclusions arrived at:

"1. That after going through the proposed standard form we question if it is advisable to adopt such standard form until the legislation of the various provinces is better co-ordinated.

"2. That we regard it is necessary before making any commitments, the standard form should be gone over by our Solicitor and carefully compared with the revised form of contract of the O.A.A. and the builders.

"3. We regard it is desirable to ascertain how far such a contract would be generally used and patronized by the architects throughout the Dominion.

"4. That we question and take exception to the general terms of the various conditions or clauses as minimizing the authority of the architect.

"5. The following articles of the general conditions are questioned, viz.: 9, 10, 11, 19, 20, 21, 24, 28, also the absence of any clause covering a schedule of prices to be furnished by contractor. Such a schedule in our opinion is absolutely necessary.

"6. Before the Institute Council accepts any form of contract it would have to secure a competent legal adviser to thoroughly examine it in relation to the existing legislation in each province affecting such contracts."

The Council also dealt with the following communications:

Letter from the Architectural Institute of British Columbia regarding patronage of home markets.

Letter from the Architectural Institute of British Columbia and the Alberta Association of Architects with reference to the proposition of the American Institute of Architects.

Letter from Fred C. Badley, advising that Hugh D. Livingston had been killed in action in France.

Letter from Alex. W. Percival that he was located in England, and tendering his resignation, which was accepted.

The President suggested that the interest accumulating to the credit of the Toronto Architectural Guild Prize Fund to the extent of $38.50 per annum be supplemented by a grant from the Association as a prize for the best architectural course at the Department of Architecture in the University of Toronto. This met with the approval of the Council and a committee, consisting of the President and Mr. Page was appointed to consult with Dean Mitchell and Prof. Wright of the University, with a view to carrying this recommendation into effect.

The President submitted a letter from Mr. Somerville (Convener), together with the report of the Committee on Government Architectural Departments, and asked approval of his action in appointing Messrs. A. J. Everett and W. K. Moorehouse, of Toronto, Gilbert J. P. Jacques, of Windsor, S. T. J. Fryer, Hamilton, and F. E. Belfry, Ottawa, as a special committee to carry on this work, which was confirmed. It was moved and adopted that the Committee's report be received and approved, and that the Secretary be authorized to write, thanking Messrs. Somerville, Cobb and White for their services in connection with this matter.

The Secretary was also instructed to reply to a letter from the American Specification Institute, Chicago, Ill., with reference to the object of collecting and distributing information regarding specifications, stating that the Association would be glad to co-operate in this matter, and asking to be placed on their mailing list.

Regarding a "Comprehensive Plan for the Exhibition Grounds," Toronto, the President reported that a board of three architects, members of the Association, Messrs. Chapman, Hynes and Wickson, have prepared a plan in conjunction with the Parks Commissioner, who was chairman of the committee. This plan has been adopted by the General Committee and forwarded to the City Council for approval.

Mr. Page reported that the Archiects' Bill had received its first reading and had been referred to a Special Committee, which will sit during the recess. It was moved by Mr. Watt, and seconded by Mr. Page that the Secretary send copy of Bill and minutes of the meeting to all members of the Association. It was further moved and seconded that the Legislation Committee be requested to prepare data for a circular to the members accompanying copy of Bill.

Messrs. McGiffin and Page, the Committee appointed at the previous meeting to consider the question of a suitable Roll fo Honour of members of the Association who took part in the Great War, reported as follows:

"The inspiration of the idea was more particularly a desire to honour those who fell in action, but as a large proportion of members were actually engaged, indirectly engaged, and had enlisted but not served abroad, this Committee after due consideration begs to recommend that all members enlisted in the C. E. F. should be included in the Roll with the name of the Corps in which they served, the rank they held, and the distinctions they earned. The names to be arranged alphabetically with the names of the fallen suitably accentuated."

The Committee was requested to co-operate with the Secretary in sending out a questionnaire with the object of obtaining information required.

The Council also took opportunity of the occasion

to express its appreciation of the efforts of the Toronto Chapter in holding the recent exhibition at Murray Kay's during the first week in May.

It was moved by Mr. Hynes, and seconded by Mr. Wickson, that the Council instruct the Chapters of the Association to convene a meeting to discuss architctural education, and that the graduates of the University of Toronto be particularly requested to attend, with a view to offering helpful suggestions to make the course attractive to students; and to urge that the Association having committed itself to the policy of not taking apprentices, students be advised as far as possible to attend the University course. Carried.

The President and Messrs. Wickson and Hynes were appointed a committee to draft a letter to the members with regard to transgression of the ethics in the profession.

On resolution by Mr. Hynes, seconded by Mr. Wickson, the request of Mr. B. R. Coon for transfer from Associate to Membership was granted.

Egyptian Government Hospital Competition

The following notice has been received by the Executive of the Ontario Association of Architects from Ian MacAlister, Secretary of the Royal Institute of British Architects, requesting that it be made known to members of the Association:

Egyptian Government.

TO ARCHITECTS:—

HH. Government invite competitive designs for the new buildings of Qasr el 'Aini Hospital and School at Cairo, with accommodation for 1,225 beds. The competition will be conducted in two stages, the FIRST of which (preliminary) is open to all architects; the SECOND will be restricted to twelve architects, six of whom will be selected by the assessor from those submitting the most meritorious designs in the preliminary competition, and six others nominated by HH. Government with the advice of the assessor, Mr. John W. Simpson, President of the Royal Institute of British Architects, Member corr. de l'Institute de France, whose judgment will be final and binding.

All applications for particulars of the competition should be addressed to HH. The Minister of Public Works, Cairo, Egypt, or to the Secretary, Royal Institute of British Architects, 9 Conduit Street, London, W. I., England.

Such applications must be accompanied by a cheque or draft for three Egyptian pounds (or its equivalent in sterling), which will be returned to all applicants who submit a bone fide design, or who return the particulars in good condition within one month from the date of their application.

Designs in the preliminary competition must be lodged not later than the 3rd October, 1921.

By Order of THE MINISTRY OF PUBLIC WORKS.

Toronto Chapter Activities

An interesting talk on the progress being made by the Royal Ontario Museum in acquiring objects of interest and value to the profession, was recently given by Mr. Currelly, curator and Archaeologist of the museum, before Toronto Chapter of the Ontario Association of Architects. A considerable quantity of furniture, the speaker declared, was now on exhibition, as well as a complete room, panelled in oak, built during the Tudor period, and brought to Toronto intact from its original, position in England. The exhibit of wrought iron work was also being added to from time to time.

Among the most beautiful things to be seen in the museum was a beautiful Renaissance doorway, carved in oak, in the style introduced by Grinling Gibbons.

Mr. Currelly spoke hopefully of the possibility of the museum erecting a special building for the exhibition of full-sized architectual casts, such as cathedral doorways, portions of the Parthenon and other objects of interests to the profession.

At a subsequent meeting Mr. Carswell, of the Carswell Construction Company explained the "Quantity System" as applied to tendering on building construction. In this connection a resolution was introduced and adopted to the effect that this matter should be taken up with the other chapters of the O. A. A., and the Contractors' Association, with the object of evolving a better system of tendering than that now in force.

Building Material Research Work

(*Continued from page* 174)

for some of the very costly varnishes now used in first-class work.

Though painting may be a very small matter in an initial building contract, its periodical repetition makes the material really important.

GLASS.

Our Research Committee started an investigation on the improvement of pavement lights, and, through the kindness of an optical expert, and the makers, samples of a new glass have been exposed in a London pavement for three years. The results of this experiment do not promise to be satisfactory, but it should really now be possible to produce a transparent medium able to resist abrasion, which would result in great improvement to much basement property.

These are but a few of the problems which deserve attention, but many others suggest themselves, as, for example, proprietary plastic floor and wall coverings, which should at least be guaranteed not to contain certain injurious ingredients. Again, such subjects as the acoustics of buildings, to which study a special institute is devoted in America and, I believe, also in Germany, though strictly outside the scope of this paper, demand much elucidation.

Flat Roofs of Cement Concrete

True architecture is the logical expression of a building's constructive features. The architects of bygone days, says a contributor to the Builders, London, England, had perforce to adhere to this principle, for they were bound by the limitations of the materials at hand, and although they did not lack ingenuity they were not able to command the resources of modern science which have made possible some of the monstrosities paraded during the past few decades as examples of the art of building.

Of all the component parts of those structures which mankind has devised for his habitation and use the roof is probably the unit which has exercised the most dominant influence upon the design. It is plain that the bearing capacity of lintels which supported the roofs dictated the columnar treatments of the ancient Egyptians and Greeks, and so established those canons of proportion which serve as models to-day. For climatic reasons the flat roof was almost universally employed in countries where the heat of the sun is great. The absence of snow and the small amount of rainfall made possible the use of materials which would not prove serviceable in northern climates. Thus, to this day in Egypt flat roofs are sometimes finished with a mixture of ashes of the vegetable fuel used for heating the baths (called "Kosrmil") and lime. The process, although of great antiquity, does not appear to have anything but cheapness in its favor.

The increasing vogue of flat roofs in wetter and colder climates is a direct consequence of the rapid development of materials suitable for such constructions. Metal sheetings such as lead, copper and zinc have been employed, but they are at best only adaptations of materials more suited to other forms of roofing, and the first real step forward was accomplished by the use of a thin layer of asphalte for such roofs. This form of weather-proof finishing received a great impetus owing to the fact that its development was concurrent with the earlier types of concrete flat roof construction, and its elastic properties appeared especially desirable in view of the cracking to which the earlier concrete works were very subject.

In passing it may be noted that asphalte progressively loses its elasticity with age, and the absence of cracks in modern roofs so finished is due more to the qualities of the underlying concrete than to the abilities of the asphalt layer to adapt itself without fracture to any movement which might take place. The expedients for the prevention of cracks in concrete due to expansion and contraction have been many and various. Some of these, admirable for their ingenuity, were doomed to failure because the physical properties of cement concrete were not taken into account. Other devices, although achieving a limited measure of success, only did so at a disproportionate cost.

Before reinforced concrete won its way to the position it now enjoys, a much favoured type of flat roof construction was that in which rolled steel joists employed as beams and "filler" joists of small section (usually 4 in. by 1¾ in.) were encased in concrete made with an aggregate of coke breeze or furnace ashes. The thickness of the concrete slab very often coincided with the depth of the small "filler" joists, so that, in effect, the roof consisted of a number of small isolated slabs completely severed from one another by the webs of the supporting joists. This system had much to condemn it. In the first place, cracks frequently occurred both in the ceiling and in the waterproof sheathing, owing to the expansion and contraction of the steel joists. In addition coke breeze and furnace ashes are not reliable aggregates, for they often contain substances which in reaction with the cement result in expansion of the mass. Cases have occurred within the writer's experience in which such expansion to roofs or floors has resulted in the thrusting out of the external walls, and thereby caused vertical cracks to appear near the angles of the buildings. In one particular case the cause of the trouble was not at first suspected and gave rise to considerable mystification. It was, in fact, asserted that it was due to settlement, but it was satisfactorily established that it was a consequence of the expansion of the coke-breeze concrete to the floors and roof of the new building. The means generally taken to avoid this danger was to insert a board—usually a scaffold board—against the wall, and to withdraw this as soon as the concrete had set, thus leaving a cavity to allow of possible expansion.

Another device which has been employed is to place a horizontal layer of asphalte (of a composition calculated to retain, so far as possible, its elasticity) over the entire thickness of the supporting walls immediately under the roof slab which rested upon it. It was thought that this would permit the concrete roof slab to shift freely without moving the walls, but if the weight of the slab, and possibly parapet walls in addition, are taken into consideration, it will, upon a little thought, be conceded that the theory is unlikely to be realised in practice. It is now generally accepted that it is not possible entirely to prevent the contraction of Portland cement concrete due to a drop in temperature or loss of moisture. It is common knowledge that most materials expand when wetted or heated, and that they contract when cooled or dried. It is not, however, generally known that in the case of concrete the changes in bulk are influenced to a far greater degree by moisture than by changes in temperature. Concrete, in fact, swells and shrinks when wetted or dried just the same as a piece of timber, although to a much less degree. Concrete when thoroughly satured expands about as much as if its temperature had been raised 1,000 degrees Fahr., and it will therefore be obvious that in order to minimize this expansion and contraction the access of moisture to the concrete must be prevented.

Modern engineering practice is to employ steel reinforcement suitably placed so as to take up and

distribute the stress along the lines of the reinforcing members. Thus, what would otherwise have been one large crack is split up into a multitude of smaller cracks of microscopic size, and no harm results.

From this it will be seen that the factors which will ensure the maximum of immunity from cracks in concrete constructions are:—

(1) Keep the concrete dry, either by an efficient waterproof sheathing or by an integral cement waterproofing process.

(2) Use only clean suitable aggregates such as gravel, shingle, granite chips, or crushed flints, and a cool cement which in itself is not liable to expand or contract.

(3) Reinforce the concrete by evenly distributed steel in small sections so placed as to take up any stress which might arise in the concrete, and thus prevent expansion and distribute the movement due to contraction.

The use of a cement waterproofing medium provides a means by which the objects named under heading (1) can be attained. The simple admixture of a reliable waterproofing powder renders the concrete roof slab watertight, and (if the other precautions of reinforcement are taken) immune from cracks. This obviates the necessity for applying a superficial coating, but if for any reason it is undesirable to waterproof the mass concrete a thin layer of waterproofed concrete can be applied to the surface of the slab of non-waterproofed concrete. The finish thus presented is extremely hard wearing and does not soften in the heat of the sun, is unaffected by solvent oils and greases, and is, in addition, highly resistant to fire.

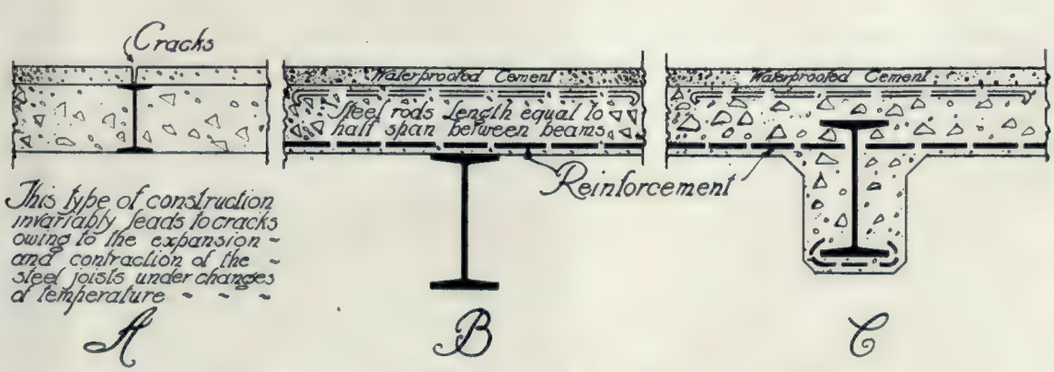
The practice of embedding rolled steel joists in concrete roof slabs is a fruitful source of cracks, which follow the lines of such joists and are due to their unequal expansion and contraction. The type of construction shown at "A" in illustration should never be employed in the formation of roofs. Type "B" is far preferable, although in cases where the maximum of head room is desired Type "C" can be used with good results.

Since the principles underlying the use of concrete became generally appreciated, many flat roofs and domes have been formed with reinforced waterproofed concrete, which many years after their construction still exhibit an entire freedom from cracks and dampness, thus providing a striking vindication as to the propriety of the material for such purposes.

Great Lake Tideways Route

A recent Ottawa press dispatch states that: The engineering feasibility of the St. Lawrence-Great Lakes scheme whereby ocean tonnage would go to the head of the lakes, will be reported upon shortly to the international joint commission by the board engineers consisting of F. W. Borden, chief engineer of the department of railways and canals, and Colonel F. P. Wooten, of the United States corps of engineers. Col. Wooten will take part in the final conference on the subject. After the receipt of the engineers' report the international commission will have three months in which to pronounce upon the economic feasibility of the project, carrying out the joint reference of the United States and Canadian Governments.

It is understood that so far as the engineering part is concerned the board will find the project wholly feasible. It contemplates the erection of a series of dams, on the St. Lawrence and the construction of ship channels in place of several of the existing canals, instead of deepening them. The cost will be very heavy. The exact estimate is not yet obtainable, but it is said to be around $200,000,000 to be borne jointly by the United States and Canadian Governments. In that connection Washington despatches have spoken of a possible international bond issue. At the first glance, the disposition would be to condemn the scheme because of its excessive cost at a time of financial depression. To meet this the argument is advanced that the power developments—the potentiality being some three million horsepower—will "carry" the cost of the undertaking. In any event no hurried decision is anticipated.



Types of Concrete Flat Roofs

What Can Architects Do To Stimulate Building

Commenting editorially on present conditions, the Architectural Forum in its May issue, presents a timely observation as to how the volume of building work can be increased in architectural offices through well organized business methods. In this connection our contemporary says:

Current building reports, encouraging as they are, represent only work for which permits have been secured. The figures for work actually under construction would undoubtedly show a considerable shrinkage. This is apparent in talking with a number of architects; there is an undeniable interest in building, but there are still many obstacles in the way that prevent owners from signing contracts. The margin between what might be termed the "asking price" and the level on which contracts can be signed, is not particularly great—ranging from 10 to 20 per cent. This fact prompts the question, "What can architects do to stimulate building?"

That architects are able to stimulate building is proved by a number of offices, known to us, that are as busy right now as at any time in their careers. They are offices in which well organized business departments are working, which enable them to follow the trend of construction costs and to present evidence to owners that they have been able to eliminate practically all costs which are not represented by honest labor and fair material prices. When the cost of a building is cut down to these basic factors, with extravagant overhead, different kinds of "insurance," and wasteful organization on the work eliminated, the result is likely to be a figure on which an owner can proceed.

One architect, in talking recently with a member of our staff, made the statement that of the work that came to his office this year, none had failed to go ahead. He has no mystic power over his clients; he has no peculiar business secrets, but he follows the simple, businesslike practice of investigating contracting and material fields sufficiently to find where the excess cost lies, and then eliminates it. To be more specific, he prepares his plans in the usual way, basing them on current data obtained by his office with reference to costs. Surveys of materials are prepared and the plans submitted for bids to contractors, but instead of confining the asking for bids to some half-dozen or more contractors, thirty or more are asked to bid. Before asking for figures, assurance is had that the contractor actually WANTS work, and that he has a reliable organization that can execute the work efficiently.

The contractors are asked to submit their bids in detail, giving sub-contract figures, principal material quotations, and their profits. The architect reserves the right to, and does, secure independent sub-contract and material quotations. In this list of thirty or more sets of contract figures there is, of course, a wide range, but at the bottom of the list there are always from four to six figures within very small amounts of one another. These represent the bids of contractors who make real efforts to buy materials and operate economically.

The results of the architect's own investigation of material prices and sub-contract quotations are checked against the general bids. If the architect has been able to secure lower quotations, they are substituted for the figures of the contractor finally decided upon. The contract is made with the contractor's known profit as a fee, and with the total estimated cost of the building as the guaranteed contract price, the work being carried on in practically all respects as under a lump-sum contract. Additional provisions are made, however, that any savings in the cost of materials, under the prices on which the contract is based, revert to the owner, and any savings as a result of increased efficiency are divided equally between owner and contractor.

This method of arriving at a contract price undoubtedly places an extra burden on the architect; it is effective, however, in eliminating excess cost, and in accomplishing that the architect has made a contribution to the welfare of the building industry that will prove a lasting asset. With the evidence of the architect's economy properly laid before the client, it is comparatively easy for him to see that he is getting as much value for his expenditure as is possible under prevailing conditions. The provision giving him the benefit of any reductions in material costs removes objections to any possible penalty for going ahead, and the wheels of industry are started, which is most essential.

Plans similar to this are in use in other offices, sometimes with the elimination of the general contractor—the purchasing of materials and the assembling of sub-contracts being done by a construction division of the architects' organizations, or as in Chicago, by an independent supervisory agent, working with the architect and known as a "construction manager". It is usual, under either method, to make a charge of four per cent. to the owner which is paid to the construction manager or to the architect, according to the actual method of handling the detailed work involved. There are advantages, however, in the service of the general contractor which cannot immediately be given by the architect, and on the whole some such method as outlined will prove most satisfactory.

Numbers of other suggestions might be offered to show that progressive architects are extremely important factors in the revival of building. The few given will suffice, however, to point the way and it is safe to say that architects who use their resources thus will profit in gaining reputations for accomplishment under difficult conditions.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER; LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO, - - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager

BRANCH OFFICES:
MONTREAL—171 St. James Street
C. S. Soutter, Representative.

WINNIPEG—336 Qu'Appelle Street
F. C. Pickwell, Representative

NEW YORK—505 Fifth Avenue
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements much reach the Head Office not later then the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, June, 1921 No. 6

A Recent Legal Decision

An important legal decision of interest to members of the architectural profession was recently rendered at Ottawa by Mr. Justice Rose, of the Supreme Court of Ontario, in the case of Brown vs. Noffke.

The case involved the erection of an apartment house from plans prepared by the defendant (Noffke) in 1914. Two years subsequent to the completion of the structure the owner complained that the heating plant was insufficient to properly heat the building. Upon examination by the defendant it was found that both boiler capacity and radiation were short by nearly one-half in each case. This, however, was remedied by the contractor putting in an additional boiler, and by the defendant assuming further responsibility and installing at a personal expense to himself of over $1,500. (due to the contractor going into bankruptcy) additional radiation so that the work would comply fully with the specifications.

This work was done in the fall of 1919, and it was claimed that the winter of 1919-20 proved that the system worked perfectly.

In the meantime, during the winter of 1918, the defendant prepared sketched for an additional building for the same client, subsequently rendering him a bill for $392, based on a charge of 1 per cent. This bill the plaintiff refused to pay, stating that he wanted a still larger boiler, or the defendant to pay him the sum of $1,200. The stand taken by the defendant was that the specifications called for a boiler of proper size and 2521 1-3 sq. ft. of radiation, although, according to the best practice, all that was required was a fraction less than 2100 sq. ft. His contention was that the size of the boiler should be of a capacity 33 1-3 per cent. more than the required radiation and that this had been provided. The plaintiff, however, claimed that the boiler should be from 25 to 40 per cent. more than the amount of radiation put in, and on this ground action was taken.

The court dismissed the claim against the defendant with judgment in his favor covering all costs and for the counterclaim of $392 in payment for his preliminary sketches.

In reviewing the evidence, Mr. Justice Rose held that had the defendant realized that the boiler that was being installed was not of the requisite capacity in excess of the radiation, he would not have accepted it. According to the specifications each contractor was to state in his tender the price for a boiler of proper size. That, however, was not the real point of the case. The real point was that the defendant was bound to use reasonable skill to provide a boiler that was proper for the heating of the building to a reasonable degree which in the interpretation of the court was equivalent to a temperature of 70 degrees when the thermometer on the outside was less than zero. From the evidence it was not established that the defendant did not use reasonable skill. On the other hand testimony was introduced that on being examined by others, the smoke stack was not clean, and that on other occassions there were complaints that bad coal was used.

Regarding the counter claim the court contended that there was no answer. The plaintiff had asked the defendant to estimate on the cost of putting up a building, and on being informed that to do this satisfactorily would necessitate the preparation of a sketch plan, had consented to same without objection. Upon being asked as to what a sketch would cost, he was informed that this would be based on the usual charge. The plaintiff did not dissent from the proposition that a sketch should be made, and in that he had accepted and had kept the sketch without proceeding with the erection of the building, it was only reasonable that he should pay for the service rendered. The plaintiff's counsel cited the case of Yates vs. Wright, which the court decided was not relevant to the point in issue. That was a case between an owner and a builder. It was held

that it was not part of the builder's business to furnish plans or sketches, but that it was part of the architect's business and when an architect furnishes them under circumstances such as the case involved, it was not only an implied, but an expressed contract to pay, because the plaintiff asking what the cost would be, and on being told that it would be the usual price, did not indicate that he was not ready and willing to pay it.

The decision is of interest to the architectural profession in general and to the members of the Ontario Association of Architects in particular, in that it upholds the association's schedule of charges for preliminary sketches based on the estimated cost of the character of building contemplated.

Concrete Waterproofing

Why concrete requires waterproofing, and the properties an integral waterproofing must possess to operate effectively with the natural properties of concrete, is discussed in Technical Pamphlet No. 8, which has just been published by the Truscon Laboratories of Walkerville and Detroit. In view of the fact that there is not an over-abundance of information on the waterproofing of concrete, an endeavor is made in its pages to supply the need of a text on the funamentals of this important subject. It is therefore more in the nature of a practical treatise on problems of this character and their solution than in the category of what is usually termed trade literature. Moreover it has the advantage of being short and concise, and can be read in half an hour. The pamphlet will be sent to any architect, engineer or builder requesting same.

Working Specifications and Details

Under the title of "Bishopric for All Time and All Clime," the Bishopric Manufacturing Company, Ottawa, has just published a 54-page booklet which photographically gives abundant testimony as to the successful use of Bishopric products in completed buildings from large hotels, golf clubs, theatres, apartment houses, churches, to large and small residential work, and structures of an industrial and commercial type. The booklet is exceptionally well printed and illustrated and contains a vast amount of useful information as well as specifications which makes it of practical value. A feature which will in particular appeal to architects and builders, are the ten pages of detail drawings compiled from standard details in general use by well-known architects, and which show the use and application of Bishopric stucco base and sheathing to various constructions and conditions. The company will gladly forward a copy of this booklet to interested parties.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in this Issue

GLENHOLME SCHOOL, TORONTO

Masonry, H. N. Dancy & Son.
Carpentry, Fred Wilson.
Hollow Tile, National Fireproofing Co.
Structural Steel, Dominion Bridge Co.
Plastering, R. C. Dancy.
Plumbing and Heating, Purdy Mansell Co.
Plumbing Fixtures, Maulson & Buchanan.
Electrical Work, Harris & Marson.
Temperature Regulators, Johnson Temperature Control Co.
Ornamental Iron Work, Canadian Ornamental Iron Co.
Oil Burners, Fess Oil Burner Co.
Hardware, Aikenhead Hardware Co..
Furnishings, Murray-Kay Limited.
Electrical Fixtures, McDonald & Wilson.
Signs, Day Sign Co.
Iron Fence, A. R. Lundy.
Boilers, John Inglis Co.

JOHN ROSS ROBERTSON SCHOOL, TORONTO.

Face Brick, Price & Smith.
Masonry, H. Lucas & Sons.
Carpentry, Fred Markham.
Fire Proofing Contractor, R. A. Rogers.
Structural Steel, Dominion Bridge Co.
Plastering, R. C. Dancy.
Sheet Metal, W. E. Dillon.
Electrical Work, Harris & Marson.
Temperature Regulators, Johnson Temperature Control Co.
Painting, James Phinnemore.
Oil Burners, Fess Oil Burner Co.
Boilers, John Inglis Company.
Hardware, Aikenhead Hardware Co.
Floor Covering, Murray-Kay Limited.
Electrical Fixtures, McDonald & Wilson.
Iron Fence, A. R. Lundy.
Plumbing Fixtures, Maulson & Buchanan.
Signs, Day Signs Co.

J. P. Anglin, B.Sc., President — *H. J. Gross, Vice-Pres. & Treas.* — *C. D. Harrington, B.Sc., Vice-Pres. & Manager.*

ANGLIN-NORCROSS LIMITED

CONTRACTING ENGINEERS AND BUILDERS

MONTREAL TORONTO WINNIPEG

Solignum — Wood Preservative—Shingle Stain—supplied in special grades for interior woodwork. Made by Major & Co., Limited, Hull, England.

PARIPAN — The finest enamel for plaster or wood; flat or gloss, in colors. Made by Paripan Limited, London, England.

FLINTEX — Concrete hardener—makes floors dust, frost and wear-proof. Made by us here.

STURGEONS — French Polish Wax—the best wax on the market for all purposes. Made by us here.

STURGEONS LIMITED BRITISH PAINT SPECIALTIES 64-66 RICHMOND STREET E., TORONTO

Toronto, July, 1921 Vol. XIV., No. 7

CONTENTS

COUNTRY HOME OF W. R. P. PARKER, ESQ., ERINDALE, ONT. 193

THE ONTARIO ARCHITECTS' BILL 197

WHY AND WHEN THE SERVICES OF AN ARCHITECT ARE REQUIRED 198

WINNING DESIGN FOR NEW WALKERVILLE SCHOOL 201

SOIL SUBSIDENCE AND ITS EFFECT 203
By Lawson S. White.

NEW UNION BANK, VANCOUVER, B. C. 207

ILLINOIS ARCHITECTS QUESTION CONTRACTORS' RIGHTS TO ARBITRARILY FIX WORKING CONDITIONS AND WAGES 209

QUANTITY SURVEY AND PAYMENT FOR ESTIMATING 210

SOME PROBLEMS IN THEATRE CONSTRUCTION 213

WAGE REDUCTION RECOMMENDED AT TORONTO CONFERENCE 217

UNCOMPENSATED SERVICES 218

EDITORIAL 219

FRONTISPIECE:

COUNTRY HOUSE OF W. R. P. PARKER, ESQ., ERINDALE, ONT. 129

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

VIEW OF TERRACE

COUNTRY HOUSE OF W. R. P. PARKER, ESQ., AT ERINDALE, ONT.

A. S. MATHERS, ARCHITECT

W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS

ARTHUR W. KRUSE, ASSOCIATE

Country House of W. R. P. Parker, Erindale, Ont.

DURING the last ten years the country house, within an hour or two by motor from the large cities has become an interesting feature of Canadian Domestic Architecture. In style it leans more to the English tradition than to the palatial and pretentious houses so common in the suburbs of large American cities. This is due to a marked difference in temperament, which differentiates the Canadian from his American cousin, and also to the more rugged Canadian landscape, from which the house site is selected. In the environs of Toronto one encounters many beautiful well wooded river valleys and deep ravines, wonderfully suited for residential properties. It is evident that, with such a background as a setting, elaborate architectural features are not the necessity that they become on a city street.

The problem of the architect in this type of house, is therefore to gain the greatest degree of comfort and both external and internal beauty by the simplest and most obvious means. He must always keep in mind, as he developes his design, that well trained servants, such as are necessary in a large and well appointed city house, are not to be had in the country, and those accustomed to the city will rarely ever be satisfied away from the town and its attractions. The house must be so designed, that the number of servants required is small and those that are necessary must be well taken care of as regards living quarters and opportunities for recreation.

As an illustration of this problem and its solution one of the most recent country houses near Toronto is shown on these pages. This house built for Mr. W. R. P. Parker, of Toronto, is situated on his farm on the Credit River, about two miles north of Erindale Village.

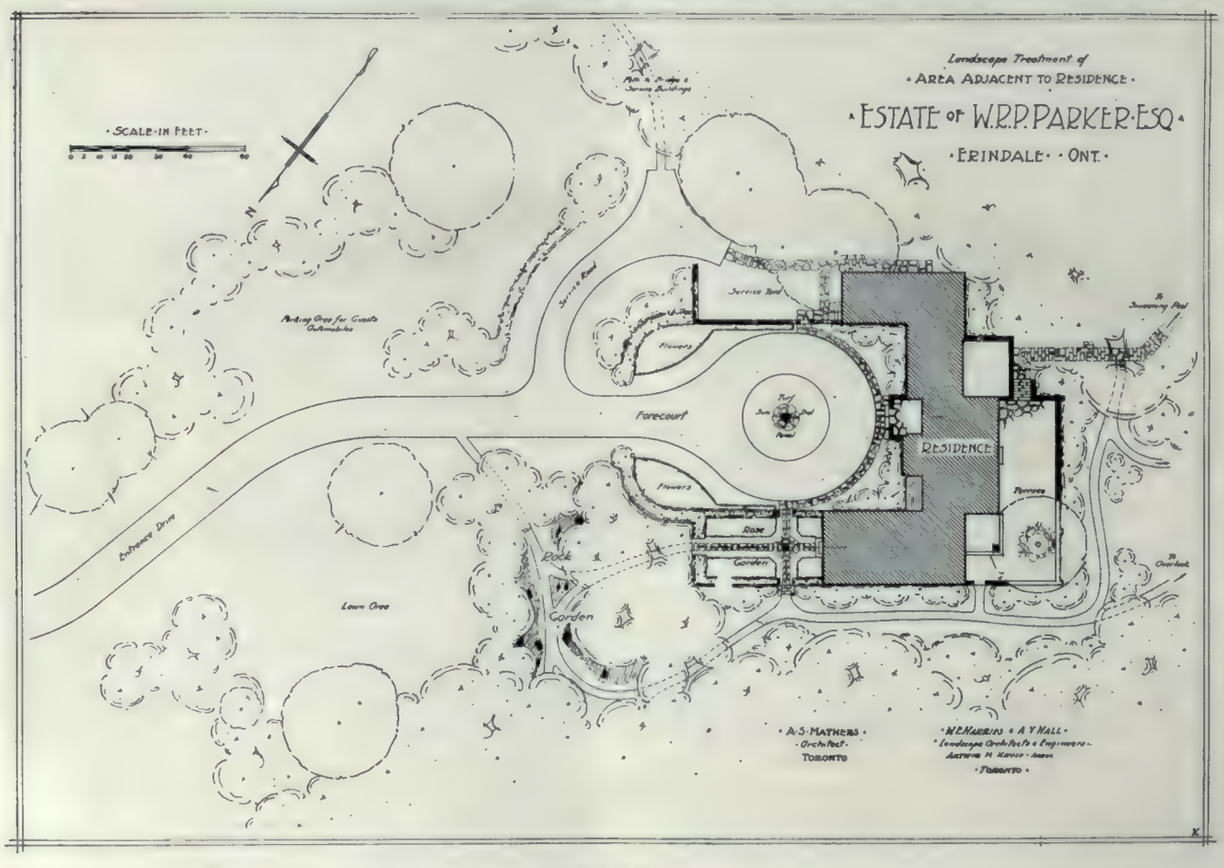
The actual site for the house was selected from several beautiful possibilities, which the long river frontage offered. It is a wooded point about eighty feet high, extending into the main river valley with ravines on either side. One of these has been utilized for the swimming pool which lies behind a dam halfway up the bank. The character of the site called for a low house, so designed that it would fit into the landscape in its natural state. The plan of the house resolved itself into a main living room facing southwest and commanding a view of the river and valley, flanked on one side by the service wing, and on the other by the sleeping rooms. These three are grouped together around the entrance court.

VIEW FROM SOUTHWEST

The main rooms are all on one floor with a basement under the whole building. The service wing contains a comfortable suite of rooms and verandah for the servants.

The living room measures about 40x25 feet and

VIEW FROM ENTRANCE COURT



PLOT PLAN
COUNTRY HOUSE OF W. R. P. PARKER, ESQ., AT ERINDALE, ONT.
A. S. MATHERS, ARCHITECT

VIEW FROM SOUTHWEST

GROUND FLOOR PLAN

COUNTRY HOUSE OF W. R. P. PARKER, ESQ., AT ERINDALE, ONT.

A. S. MATHERS, ARCHITECT

has grey stucco walls and a beamed ceiling. On the east side is the door to the entrance porch and a large wood fireplace. On the opposite side French doors open to the dining porch and the terrace. The bedroom wing lies to the north of the living room and contains five bedrooms and two bathrooms. A corridor running from end to end provides free circulation of air and the door at the easterly end serves as a means of bringing baggage in without going through the living room.

The terrace on the southwest is about 25 feet wide and is paved with flag stones. Steps lead down from the southerly end to a path which leads to the swimming pool and tennis court.

The exterior design was controlled to a great extent by the materials at hand. There was an abundance of good building stone all along the river bed a few hundred feet from the house. This was used for all the exterior walls and for stone flagging, except in the dining porch, where dressed buff Indiana stone was used.

This stone is rather small in size, seldom being more than 8 inches in thickness, and when laid in white mortar with a good wide joint, presents a very attractive wall surface.

The plan being somewhat rambling, an informal style of architecture was use and casement windows, and a high pitched roof are features of the design.

The fact that the service wing adjoined the entrance court and the servants' verandah commanded a view of the approach, a screen of some sort was necessary to hide the unsightly mess of the service yard, and to maintain the privacy of the entrance. A stone wall with lattice panels solved this difficulty.

The mechanical equipment consists of a self-contained water pumping and electric lighting plant. A large pressure tank does away with the unsightly elevates tank, and is much easier to keep from freezing. A gasoline engine supplies all power necessary for the dynamo and water pump.

LIVING ROOM
COUNTRY HOUSE OF W. R. P. PARKER, ESQ., AT ERINDALE, ONT.
A. S. MATHERS, ARCHITECT

The heating of the house is accomplished by hot air furnaces. There is a marked advantage in using hot air in a house of this type. Heat can be raised in fifteen minutes and there are no water pipes to freeze or to empty and fill when the house is used for a week-end in the winter.

The treatment of the grounds about the residence is very simple, in its arrangement, and aims to preserve, add to, and make accessible the natural beauty of the surroundings.

The entrance drive, about a half mile in length, runs through wooded and meadow areas, and from the point where it emerges from the wood, the first view of the house and setting is obtained from an elevation across another meadow. Plantations of shrubs of mainly native varieties, form the line of

the demarcation between the meadow and the lawn, drive running through this lawn area to the fore court.

The suggestion of enclosure made by wings of the house and service yard wall is carried on by cedar hedges terminating with a large cedar, later to be clipped, on each side of the drive. As the architecture of the house is low, the planting at its base is of materials which will only attain a limited height. Dwarf evergreens were used for this purpose, with groups of perennials and bulbs among them to give required colour during the summer months.

The entrance from the fore court to the north wing and trails beyond, is made by passing through the small rose garden. The main entrance to the house is connected with the rose garden, on the one hand, and the service gate on the other, by a flagged walk raised slightly above the grade of the roadway.

Outside of the fore court a depression was utilized as a rock garden, through which a walk leads to the diverging paths along the wooded slopes. Opposite this, and running from the service road, is a path leading south across the bridge to attractive points beyond.

The treatment of the west front of the house consisted merely of shrubs and perennials planted along the base of the walls, and the paths, and of adding quantities of wild and semi-wild perennials on the banks of the ravines, particularly along the paths. The contours of the ground remained undisturbed on account of the natural tree growth, and the natural forest floor was left except where cutting of vistas rendered the foliage too light to maintain it.

The Ontario Architects' Bill

THE Architects' Registration Bill introduced at the last session of the Ontario Legislature, has already received its first reading, and has been referred to a special committee of the Legislature for consideration during the summer recess.

The bill is the result of over six months' work with a joint committee of the architects and engineers but eventually it was deemed advisable for each profession to seek separate legislation, with the result that the Legislation Committee of the Ontario Association of Architects drafted the bill as presented.

A feature of the Act, as proposed, is that it. eliminates any attempt at "closed corporation" which has mainly been responsible for the failure of legislation of this kind proposed heretofore. With this objection removed the bill will undoubtedly receive much more favorable consideration. Its main object is to establish a standard of qualification which will give the architectural practitioner a legal status similar to that which obtain in other professions in the province, with administrative power vested in a registration board appointed by and directly responsible to the Government. The draft of the bill follows:

A BILL FOR AN ACT TO REGULATE THE PRACTICE OF ARCHITECTURE IN ONTARIO

His Majesty, by and with the consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

This Act may be cited as the Architects' Registration Act.

The Lieutenant-Governor by Order-in-Council shall appoint a Board to be known as the Architects' Registration Board, to consist of five persons, all of whom shall be architects, British subjects, and residents of Ontario, qualified to register as architects under this Act, and one of whom may be the professor or assistant professor of architecture in the University of Toronto.

The term of office shall be five, four, three, two and one year, respectively, for the members in the order named in the Order-in-Council appointing them, and the Lieutenant-Governor in Council shall appoint annually one member for a term of five years. Vacancies occurring on the Board shall be filled by the Lieutenant-Governor in Council.

Upon its appointment, and annually on the appointment of the new member, the Board shall meet and elect one of its members to be Registrar, who will also act as presiding officer of the Board.

The Board shall, subject to the approval of the Lieutenant-Governor in Council, draw up regulations for its activities as to:

1. The standard of preliminary education required of a candidate applying for registration. (High School leaving Examination.)
2. The subjects and evidence of attainment in same, that will be required of candidates for registration. (The equivalent of the final examination of the Department of Architecture of the University of Toronto.)
3. The method of conducting examinations to ascertain the candidate's knowledge of the above. (Time, place and fees for examinations.)
4. The registering of successful candidates. (The fees for registration and annual renewal of same.)
5. Setting forth the standards of practice to be observed under this Act.
   (a) (Restricting architects to rendering professional services only, and prohibit them from acting as both architect and contractor.)
   (b) (Requirement required of non-resident architects wishing to practice in Ontario.)
6. The hearing of charges against persons accused of violating this Act, and the penalties for such violation.

The Board shall annually submit a report of its activities to the Lieutenant-Governor in Council, including an accounting of all moneys received, and

an estimate of the expenditure necessary for its activities during the ensuing year.

The Board shall, for one year after its inauguration, register all persons who are British subjects and residents of Ontario for not less than one year prior to the passing of this Act, who can prove to its satisfaction that they have been prectising architecture in Ontario during the year previous to the passing of this Act.

On and after the passing of this Act no one shall practice under the title "Architect" unless he is registered under this Act.

On and after the passing of this Act all Corporations expending moneys raised by taxes or public credit shall have all building operations costing over Five Thousand Dollars, erected under an architect.

The subjoined letter drafted by the Legislation Committee of the Ontario Association of Architects and sent to Premier Drury at the time the above bill was presented, more fully explains its objects and sets forth very valid reasons why such legislation should be granted:

THE HON. E. C. DRURY,
Premier of Ontario.

DEAR SIR:—

In presenting the accompanying bill for your consideration, we would state, that its objects are to give to the Profession of Architecture in Ontario an educational and legal status more nearly paralleling that which obtains in the other professions in this province, and in Architecture in the neighboring States. This is essential, if, as you have stated, the Architecture and Art of the Province is to fittingly interpret the life and thought of the people of Canada.

It is the Community that requires the trained Architect to handle its problems efficiently, and in order to obtain them it must provide the means for adequate training. This training should be at least equal to that provided by any other community of similar status.

It follows naturally, therefore, that the chief requisite in obtaining this legislation is a further development of the Department of Architecture in the University of Toronto, to insure to the Community that those who practice under the title "Architect" are properly trained. This being accomplished, we submit the economic necessity of conserving the practice of the Province for the men that avail themselves of the training facilities that the Province provides.

At the present time so many business men of the Province apparently consider it necessary to patronize American architects, that the resident practitioner does not secure the normal practice of his own Province. This has proven an almost insurmountable difficulty to all but an exceptional few in the profession, and is in striking contrast to the practice of the other professions, all of which are held in high esteem by their fellow citizens, owing largely to the fact that they have had opportunity to develop to their full ability because the practices of their respective professions in the Province have been conserved for them.

In preparing this bill every effort has been made to avoid "class" or "closed corporation" legislation by insuring standards of practice based on educational attainments, and by having a Registration Board directly responsible to the Government instead of to the Profession or any Association composed of practitioners.

Yours truly,

J. P. HYNES,
FORSEY PAGE,
Legislation Committee
(O. A. A.)

Why and When the Services of An Architect are Required

FOLLOWING up their previous effective publicity work the Ontario Association of Architects, through their publicity committee, have recently issued a pamphlet of much interest to the lay public. It is explained in the foreword that many people have been at a loss to know when and why they require the services of an architect, and that there is a lack of public knowledge as to what should be expected of an architect when he is employed. The pamphlet is issued with the hope that it will make these matters clear, and by the elimination of misunderstanding, smooth the path of all those involved in the consideration of buildings. The pamphlet reads in part, as follows:—

WHY AN ARCHITECT IS REQUIRED

An owner must have information as to what he actually desires before he can "buy" either land or a building to put on it to the best advantage.

An architect should know whether or not a property will meet your requirements for daylight distribution, economic layout and so forth.

He is able to present data which will enable you to make intelligent decisions as to type of construction and arrangement, which will serve you best.

His knowledge enables him to provide for the proper planning of "traffic lines," the disposition of "departments" (whether in a factory or a house), the economic location of plant, the minimizing of insurance and maintenance charges, the artistic appearance of the building, and many other matters.

There is much detail work in obtaining prices and the letting of contracts. An owner requires expert advice and service in these things.

The architect provides this service.

When construction is under way and owner's interest should be considered in the day to day questions which come up.

The architect is the owner's representative on the works.

Everyone wishes to have buildings pleasing to the eye, if for no other reason than to increase their commercial value.

An architect is trained to clothe utility with beauty.

Building is a very complex "manufacturing process." It involves many trades and interests. These, if left to themselves, do not consider their own tasks in relation to the whole as carefully as they should.

An architect guides these interests into a proper relationship.

How An Architect Works

By means of preliminary consultations, rough sketches and approximated estimates, the requirements of the owner are brought to light. In the architects drafting room and office the problem is analyzed. All possible solutions should be discussed with the owner. A definite solution is then prepared in the form of working drawings and specifications, which show exactly and in detail what contractors will be required to furnish.

This gives a defined basis upon which prices are secured. The architect obtains these prices from various contractors, and places them before the owner with any comment his experience leads him to offer.

When the contractors are decided upon, the architect relieves the owner of the detail work of closing contracts, and sees that he is properly protected.

Constantly during the course of construction, detailed instructions and drawings are supplied to supplement and interpret the working drawings and specifications upon which contracts are based.

The superintendence of an architect is general in its character. It is more that of a director who coordinates the work, than that of a policeman. When close and continuous supervision is desired, arrangement for the employment of a clerk of works should be made.

The owner is protected against risk of liens or of over-paying for work, by the fact that payments are made upon the certificate of the architect, who is experienced in such matters, and is in touch with conditions. The architect keeps account of changes and adjustments, and safeguards the owner in these things.

The Selection of an Architect

An architect influences the spending of an owner's money. It follows that the owner should assure himself that his architect is honest and worthy of confidence, and that he commands, by education and experience, a knowledge of planning and design from both the economic and artistic standpoint; in short, that he has a "professional" standing.

To employ professional service on the basis of the amount of the fee, represents the practice of choosing for cheapness rather than quality. No work is more easily slighted. Incompetent service working for a small fee often means more loss in costly errors, unnecessary construction, etc., etc., than the entire cost of competent service.

Selection of an architect by competition is a custom fraught with evils and danger for both client and architect. Many a competition has been won with a "catchy" drawing, which did not work out, and many architects have wasted time, money and skill on a prospect which never materialized.

Usually it is better for an owner to co-operate with his chosen architect in a careful consideration of all existing prototypes, alternative schemes and data, than it is to be limited in selection to a few designs submitted by men who are often not closely in touch with the requirements.

If, for reason, a competition is held, a study should be made of the pamphlet prepared by the Ontario Association of Architects, entitled "Code for Conduct of Architectural Competitions." Loss and unfairness to both owners and architects, will be avoided if this is done.

Plans for buildings, except of smaller types, are not kept in "stock." Each building requires special consideration and study, and this is not very thorough if given for nothing.

After He is Chosen

Trust your architect, and value his opinions. If you cannot do this, don't choose him.

Make your requirements and resources clear. He isn't a mind reader, and he needs to know these things in order to serve you well.

Discuss the question of his fee with him. It avoids misunderstandings.

Remember, that no first plan was ever the best one. It is easier to alter plans than to change bricks and mortar. Time spent in getting your plan right is well spent.

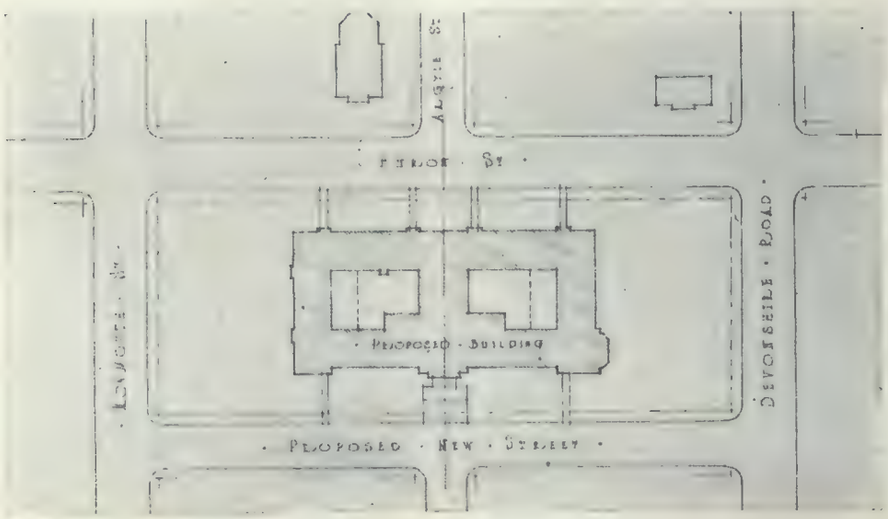
No architect can get good work out of a poor mechanic, or make a dishonest man honest. It is not always wisest to accept lowest tenders. Your architect's advice is useful in selecting your contractor.

"Value for value the world over;" don't expect to get more than you pay for.

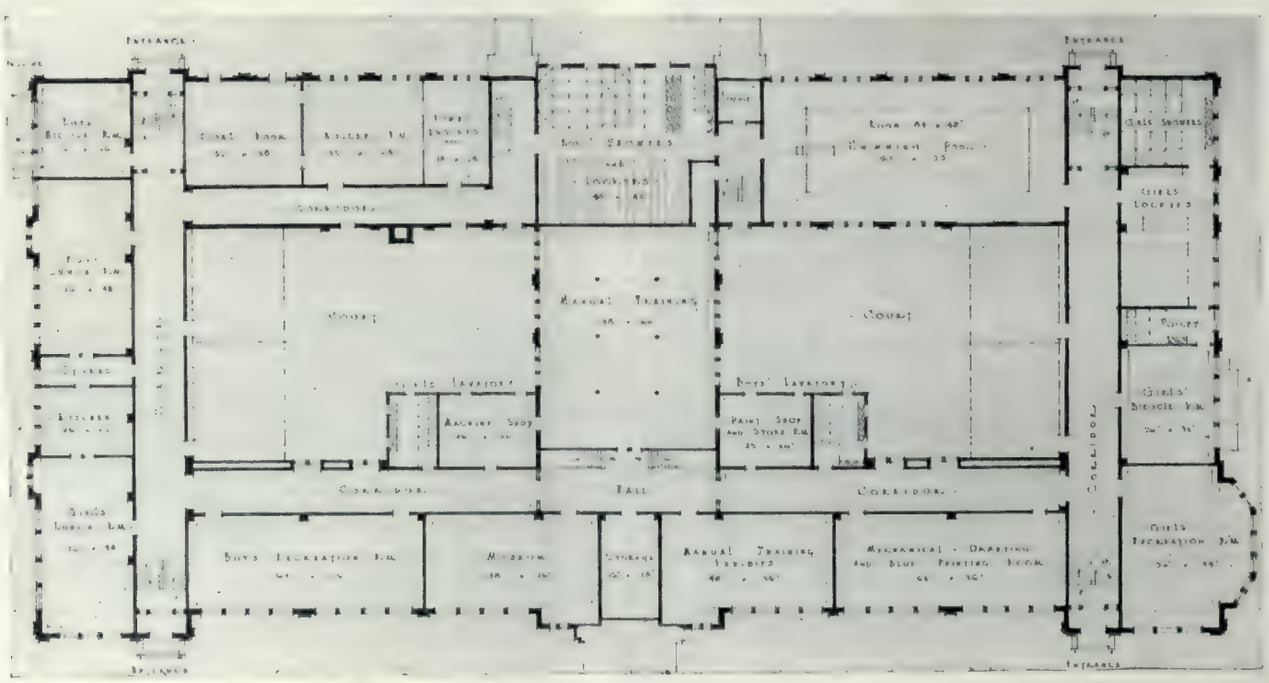
New Oxygen Plant for Montreal

In these days of general industrial improvement it is refreshing to note the spirit of optimism evidenced in the announcement recently authorized, that the Dominion Oxygen Company, Limited, will break ground in mid-July for a new quarter-of-a-million-dollar oxygen plant at Montreal, which will double the company's present capacity. The building will be 100 ft. x 100 ft., and will be substantially a duplicate of the company's Toronto plant, which until now has supplied oxygen to Canadian industrial users through five district distributing stations. The Montreal plant will be the second of five producing plants projected at the time the company was organized last year.

FRONT ELEVATION



PLOT PLAN



BASEMENT PLAN

REAR VIEW, SHOWING SIZE OF BUILDING TO BE ERECTED AT PRESENT
WINNING DESIGN, WALKERVILLE, ONT., HIGH SCHOOL COMPETITION
BOYDE AND THOMPSON, ARCHITECTS

Winning Design for New Walkerville School

THE proposed public school to be built at Walkerville, Ont., from competitive designs by Messrs. Boyde & Thompson, architects, calls for a structure to be situated on a site extending 640 feet north and south and 225 feet east and west, with the main elevation facing north.

The site is in the very heart of the residential district, immediately south of St. Mary's church, a beautiful edifice of old English type, designed by Cram, Goodhue & Ferguson. To the west is Willistead, the home of the late E. C. Walker. The building will be located practically in a park, with four equally important elevations. It was decided by the architects, in view of the architectural importance of the building, that a modern Gothic style of architecture should be used, to be in keeping with the surroundings.

The terms of the competition as drafted by the Walkerville School Board, made provisions for a structure to contain 24 class rooms, of which only 16 rooms are to be built at present. In addition to the 24 class rooms, the conditions set forth also provided for the following additional accommodation:—

Auditorium to seat approximately 1,000.

Gymnasium, 50x75 feet, with gallery, swimming pool, etc.

Physical laboratory, with lecture room on ground floor.

Chemical laboratory; lecture room on ground floor.

Manual training room in basement.

Domestic Science room with sewing room on first floor.

Commercial room with Typewriting room adjoining.

Biology Room.

Art Room.

Library and Reading Room.

Nurses' Room.

Principal's Office and Reception Room.

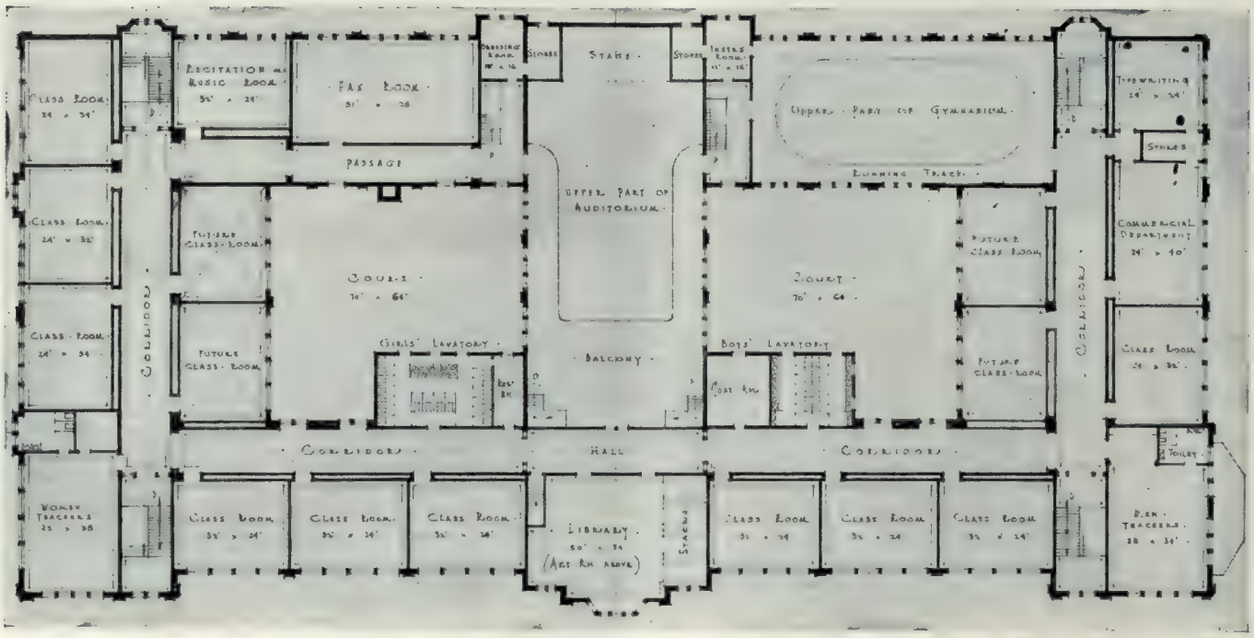
Teachers' Room.

Two Lunch Rooms in basement with Kitchen between.

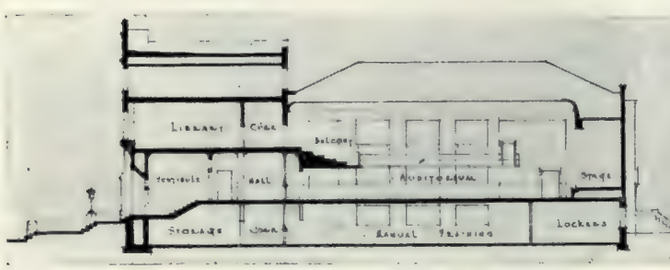
It was further provided that there should be standard toilet accommodations on each floor, together with ventilated lockers built in corridor walls, and a boiler room to be located outside of the main building.

In assessing the designs, special consideration was given to the site, which is conceded to be one of the finest possessed by any community in the Province, and therefore regarded as worthy of the best building that can be produced for the amount which the board has at its disposal. It was felt that the exterior design should be of good architectural character, simple, dignified and expressive of the purpose for which the building is to be used, neither detracting from nor suffering by comparison with the best buildings in the vicinity.

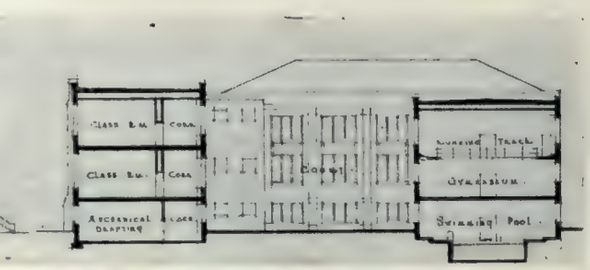
The Board, having reached a unanimous decision following a conference with their professional adviser and assessor, on the date first set for the award, considered that there were only four sets of designs submitted in the original competition that clearly indicated capability to solve the problem, and that none of the four designs selected warranted final



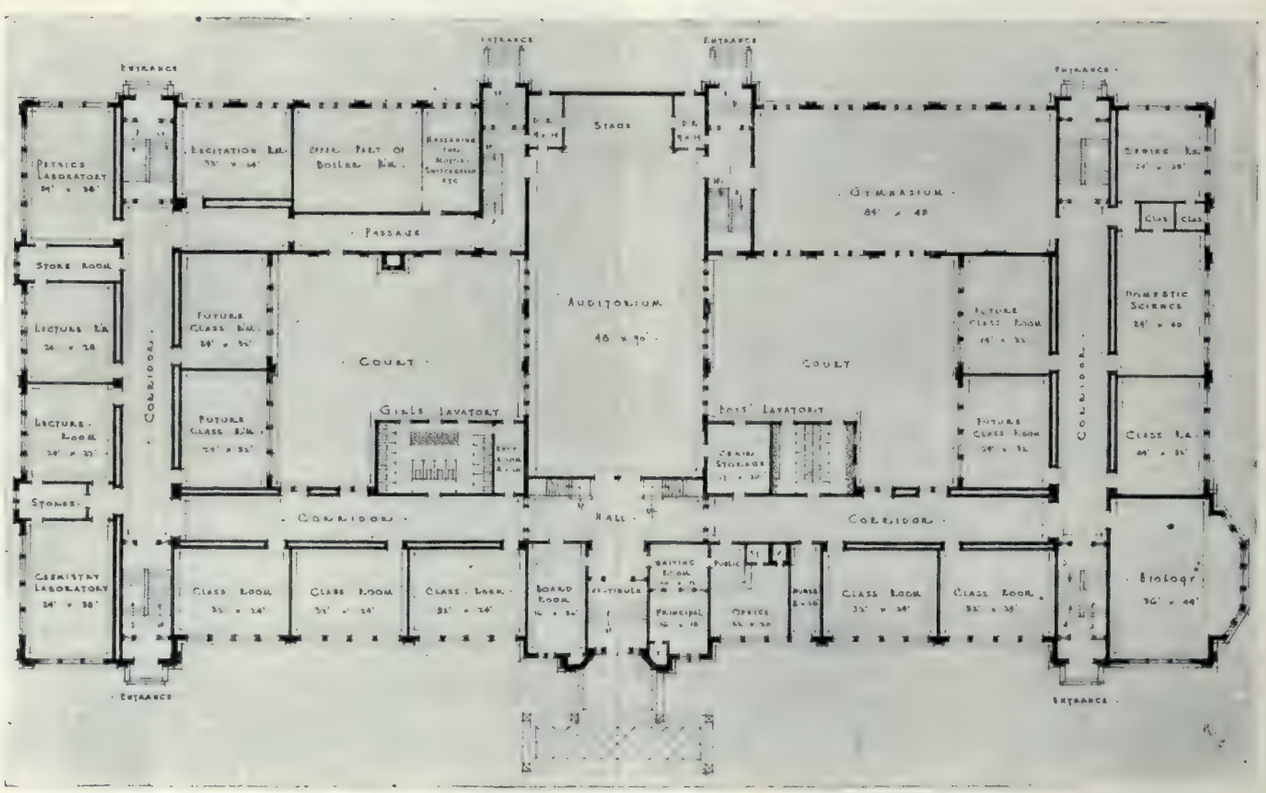
UPPER FLOOR PLAN



CROSS SECTION AT CENTRE



CROSS SECTION AT WEST WING



GROUND FLOOR PLAN

WINNING DESIGN, WALKERVILLE, ONT., HIGH SCHOOL COMPETITION

BOYDE AND THOMPSON, ARCHITECTS

decision. as each of the four schemes had some serious defect or defects.

In view of these circumstances, and in an earnest effort to reach an affirmative decision rather than to abandon the competition, it was deemed advisable to carry it forward into a second phase, limited to the four firms, whose designs were selected in the first stage, with the result that the above firm's scheme was selected.

In awarding this design the first place, it was considered that from a point of all-round general merit it adequately met with the terms of the competition. The attractiveness of its layout in plan, the disposition of its parts, particularly of the class rooms, so that they will obtain the best light, the size of its courts, and the strength and architectural character of its exterior design, resulted in its final selection and subsequent confirmation by the Board.

A feature of the competition was the fact that it was restricted to architects who are bonafide residents of Canada and practising in this country. A further stipulation was that their business associates, if any, such as partners, shareholders and engineering experts, should also be Canadians, and that the materials to be employed, so far as possible, should be of Canadian manufacture.

The Board were guided in making their decision by Mr. Herbert E. Moore, President of the Ontario Association of Architects, who acted in the capacity of professional adviser and assessor, and who drafted the terms of the second phase of the competition.

According to the final terms a sum of $250 is to be allowed to each of the four competitors submitting drawings in the second phase. In the case of the winning design this amount will form part and be merged in the commission for the work in the successful authors' agreement with the Board.

The building will be of fireproof construction and when finally completed, will cost $450,000. The portion at present to be erected will eliminate the two end bays shown in the main elevation, and will be of the size indicated in the rear view, the scheme permitting extensions on either side as further accommodations are required.

Land Subsidence and its Effects

By Lawson S. White

Paper read before the British Concrete Institute.

IT IS not the intention of this paper to present new theories nor even to dwell upon any particular incident, but rather to make a general survey of the subject by citing recent examples of failures due to subsidence, and the opinions of engineers as to their cause, and noting in a general way, some of the methods employed either in preventing such failures or in remedying them after their occurrence.

The first consideration in designing the foundations of a structure is the bearing capacity of the ground. Efforts have been made to tabulate the various types of bearing surfaces met with, in order to give to each a definite value for calculation. This tabulation could apply only in a very rough sense, since even the description of soils varies with the locality and with the individual view of the engineer. The same material may vary considerably in different parts of the same site, or may present widely different properties as the result of some subsequent reaction.

The Geological Survey of Great Britain has recorded invaluable information as to the physical properties of soils and the relation in which they stand to one another, and a study of the geology of a district is of the greatest assistance in gaining a true appreciation of the conditions to be expected.

For small work the rule of thumb calculation for bearing values is usually all that is required, provided that local conditions are respected, but for heavier work, where large areas are covered and big sums of money expended, more accurate methods, following a thorough investigation, are essential.

Early Theory and Practice

It is thought advisable here to make a brief reference to established principles of earth pressures and compare them with conclusions drawn from more recent investigation and theory. One of the earliest theorists to submit a mathematical treatment of earth pressures was Rankine. Obviously, as a pioneer in the subject, he had to assume the simplest conditions possible, and since the general run of earth did not seem to possess the characteristics of a solid, he took as his standard dry sand, in which cohesion was absent and only the latent force of friction was available to keep the mass together and transmit pressures throughout its bulk. Many engineers have since realized the unsatisfactory results which come from applying Rankine's formula to soils of a different character to that of sand such as clay, etc , and valuable experimental research by Darwin, Wilson, Bell, Crosthwaite and others has shown that cohesion plays an important part in earth pressure.

The uncertain and unstable nature of cohesion in soils forbids a definite classification of cohesive values. In many cases, cohesion is largely attributable to water content, a certain percentage of which gives a maximum cohesive value. Should the water either dry out or increase in quantity—contingencies most certainly are to be expected—the cohesive value is quickly changed. If, therefore, a value for cohesion is assigned to a certain soil, due care should be taken that the character of that soil is not influenced by external agencies.

More Recent Theory and Practice

Recent investigations have tended to show that earth in foundations behaves somewhat as an elastic

solid of low strength and low shearing value. It might therefore be treated as any other structural material, when its relation of stress to strain, or load to settlement, has been ascertained. The elasticity of earth is commonly observed by a slight swelling or rising of ground after a load is released.

A load is considered to be transmitted to the earth over an area which is constantly increasing with its depth from the surface, and the principle of the bulb of pressure indicates the method of transmission of pressure from a load to the surrounding earth. If the bearing power of the soil at the base of a pile group is exceeded, it is obvious that a settlement must occur, and this will be arrested only when the bulb of pressure for the whole group has been established in equilibrium.

A soil which has cohesive properties will naturally derive support from the earth in contact with its lateral surfaces. As the area increases the lateral surfaces become relatively smaller in proportion to the area, and consequently a larger unit load can be supported over a smaller area than over a larger one. This fact is frequently overlooked, and soils tested by loading a small area are often thought capable of supporting the same unit load over an unlimited area.

In cases so far dealt with the author assumed a homogeneous soil, or a soil which grows more compact with depth, but instances occur where the existence of underlying strata makes it necessary to change treatment. The problem then becomes rather complex, involving the calculation of stresses in an overlying stratum acting as a plate on a yielding support.

Let us now consider under what conditions the state of the soil contributes to the failure of foundations.

Coast Erosion

The sea is one of the most troublesome an relentless agents, and examples of its effects are only too frequent. By constant storm and wave action the coast is worn away and undermined, or by water penetration to clay strata a greasy surface may be formed on which the mass above can slide forward and downward to the sea. Protective measures against wave action, such as groynes and sea-walls are a partial and in many cases a complete cure.

Local Erosion

River erosion, either by an alteration in the direction of the flow or by scouring the channel, is chiefly to be expected in countries subject to torrential downpours. Exceptional floods may open up a new course or undermine and destroy existing structures. In regions thus affected a practical method of strengthening soft banks is to plant deep rooted vegetation in the slope. Where a river wall is liable to be undermined by a deepening of the river bed, a flexible mat, consisting of large concrete blocks threaded on wire cable, has effectively prevented scour.

It often happens in gravel soils that a stream flows beneath the surface. Near a river, where a heavy building is founded on alluvial deposit which covers the ballast bed, the soil may be forced down to a level at which it becomes effected by the erosive action of the flowing water. In such cases it is advisable to take the foundation to ballast.

Careless construction of drains and water mains is a frequent cause of destruction of property in towns. A leakage frequently grows and may wash away the earth in its passage, and thus often causes an ugly settlement which it has access to the foundation bed of a building. These leakages may sometimes be due to a break caused by a slight natural subsidence or a swelling of clay soils in the wet.

Subterranean Workings

In mining districts where careless methods have been employed, subsidence of large areas of land with consequent destruction of property is only to be expected. Instances are quite common in the coalfields where the seam is near the surface, and they are also very frequent in salt mining districts. The remedy lies in careful backfilling after mining or in the provision of adequate permanent supports. An irrecoverable waste of valuable fuel is caused by leaving 30 per cent. of the coal seams in pillars to support the roof.

Chalk as a foundation bed should be well tested, since it is liable to undergo dissolution, leading to the formation of cavities or "pipes" which may cave in under pressure.

Organic Interruption

Buildings founded on timber grillages often subside because of the decay of the timber. If the water level changes constantly, and the foundation is subject to alternate wet and dry periods, this decay is rapid; but timber may last well in earth always saturated with water. Top soil must be avoided as a foundation for buildings and, if feasible, for embankments, since it is honeycombed with wormholes and root channels, and it should always be stripped to a sound depth. The subsidence of earth-fills is often due to neglect of stripping. Water usually penetrates to the depression caused by initial subsidence, and so lubricates a surface on which an extensive slide of the embankment may occur.

Natural Shrinkage of Ground

Where large tracts of marshy ground, with thick peaty top soil, are drained, a considerable subsidence takes place. This is due to three main causes—drying, decay, and cultivation.

Since a country of this type is usually very flat and almost waterlogged, the drainage system must be very carefully thought out, and provision made for maximum shrinkage. As the water table is lowered, so the grades change, and unless this is allowed for, a pumping plant or drainage system may be rendered useless. Building on slowly subsiding soils usually settle equally and without damage, but the decay of timber pile foundations subsequent to the lowering of the water level is a frequent cause of failure.

Shrinkage of Earthworks

It is moot point with engineers whether or not earth taken from a cutting shrinks when made into an embankment. From exhaustive investigation of actual works it would appear that in calculating excavation quantities an allowance should be made. It would be difficult to compact earth more closely than nature does, and the density of the soil increases with its depth. Top soils, however, contain a considerable percentage of voids caused by frost or organic action; and since most embankments are built of soil of this nature, taken from shallow excavations, it is only to be expected that, quite apart from apparent shrinkage of volume due to subsidence of foundation bed and loss of volume due to transportation from cut to fill, or else due to rain erosion, a decrease in volume will result from handling and deposition and subsequent pressure in the fill.

Made-up ground takes time to settle finally, in spite of most careful watering and rolling in deposition. "Hydraulicing," a modern method of building large fills by pumping the material into place with water, resembles more closely the natural method of formation and produces best results. Unless it is thoroughly investigated and tested, "made-up" ground should be avoided as a foundation bed for heavy buildings.

Weather Effects

Every building foundation should be placed below the frost line, to avoid failure either by upheaval through expansion by frost or by subsidence on account of the weakness of frost-loosened soil.

On works, such as new roads, where very shallow foundations are only practicable, great care must be taken over the drainage of the subgrade. There are instances without number in which a waterlogged subsoil has frozen and caused wholesale bursting up of miles of new roadways.

Clay soils are very sensitive to weather changes, since they swell considerably and contract when dry. This generally accounts for the all too frequent sight of cracked or leaning garden walls and gate piers. To avoid frost and weather action it is advisable to lay foundations, according to local conditions, at from five to eight feet below the surface.

Alteration of Water Level

Water, when present in soils at a more or less constant level, often accounts for a certain amount of the bearing capacity, since it keeps the earth in a swollen condition. A change of bearing capacity is therefore to be expected when the level of the water is altered. The change occurs usually on account of a fall of level, in which case a natural subsidence follows the shrinkage.

The lowering of the water level may be brought about in many ways, as, for example, by artificial drainage, by drawing from wells or by pumping, by natural drainage, or drainage to nearby excavations or to deep railway cuts or tunnels in the neighborhood.

When pumping operations are extensive and prolonged, and a flow of water is drawn from adjacent sources, fine particles are often carried away by the current. This continual robbing of the subsoil must eventually cause a subsidence of the overlying ground.

The eradication of the evil of wet basements by subsoil drainage often introduces the greater evil of foundation failure.

Sliding

The resistance to movement created by friction of soils on soils or structures on soils is the fundamental cause of their stability. Many failures of embankments, retaining walls, dock walls, etc., are attributable either to subsequent loss of frictional resistance or to the exceeding of the resistance value in design.

Water is the chief enemy, and, unfortunately, it is almost impossible in many cases to avoid its penetration to foundation beds. Deep, porous, sandy soils drain themselves freely, but clay soon becomes saturated, loses cohesion and frictional resistance, and offers little resistance to the lateral thrust of super-imposed soils or structures.

Good drainage is therefore essential where possible. In cases where it is not possible to avoid water penetration, foundations must be taken down far enough to ensure their stability under the worst conditions, and lateral thrusts should be relieved or balanced to reduce their efforts to a minimum.

Flowing of Soil

When its cohesive strength is exceeded a soil has a tendancy to flow like a plastic mass. In some cases the breaking down of cohesion destroys a resistance that cannot be regained, and movement continues until the pressure is distributed over an area large enough to bear it.

Landslides

Excavations for new buildings in districts already built upon are a constant source of danger and trouble on account of the little attention paid to earth pressures, and even when shoring is placed to counteract the thrust of the earth behind, it is often inadequate or removed too soon. A slight settlement may break a sewer or water main, and thus develop into a much more extensive slide.

At first sight there appears to be many varieties of land slides, but on investigation we find that they are mainly attributable to the same cause—namely, water action. In addition to lubricating a surface, water will transmit the pressure due to its head on the underside and at the back of the slide and so force it forward. The avoidance or elimination of trouble seems to be achieved by a thorough investigation of the geology of the district before construction is begun and by drainage where necessary.

Unequal or Excess Loading on Weak Soil

So far failures due to unforeseen or unexpected natural conditions have principally been considered. More often, however, the human element is at fault, and this is not to be wondered at when so little

(*Concluded on page 221*)

ABOVE—GENERAL EXTERIOR VIEW NEW UNION BANK BUILDING, VANCOUVER, B.C. BELOW—VIEW OF BANKING ROOM

SOMERVILLE AND PUTNAM, ARCHITECTS

New Union Bank, Vancouver, B. C.

The new premises of the Union Bank at Vancouver, illustrated herewith, is a notable acquisition to the several fine buildings which this institution has erected in the past few years, and serves as its head office in the Pacific Coast district. The building, which is of Italian Renaissance design, is three storeys high and of reinforced concrete construction. The exterior is faced with Haddington Island stone, a durable native product, the stone carving and bronze work shown in detail in the accompanying views being particularly worthy of note.

On the interior, the main floor chiefly resolves itself into one large banking room, which is entirely free from any pillars or obstructing columns. This room has a 32-foot ceiling, and is finished in Caen stone. The counters and fittings are of Hondurus mahogany, bronze and marble. The ceiling is richly decorated with plaster ornament and is finished below with a medallion designed freize. On the mezzanine floor the space is divided into a directors' room, superintendent's office, janitor's room and women's rest room. The electrical installation includes an inter-phone system connecting the various departments, and a dictograph and messenger call service. The large banking vault and safety deposit boxes are situated in the basement and are equipped with the latest protective devices.

The complete cost of the building was in the neighborhood of $500,000. The architects were Somerville & Putnam, and the details were drawn by Mr. Harold H. Ginnold, their local manager, the stone carvings being executed from full size models in staff made by Mr. C. Marega, a well-known Vancouver sculptor, who was also responsible for the models for the bronze metal work and the execution of the interior wood carving.

NEW UNION BANK BUILDING, VANCOUVER, B. C.

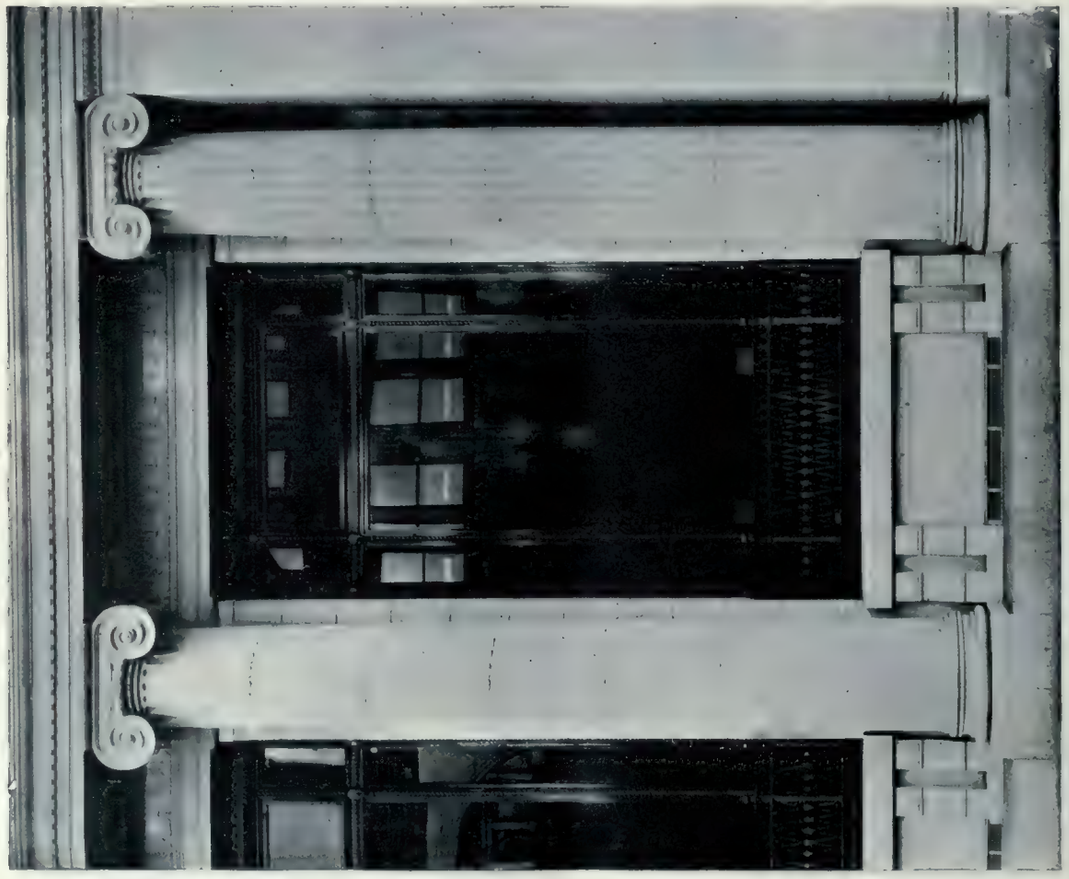
SOMERVILLE AND PUTNAM, ARCHITECTS

VIEW FROM ENTRANCE

New Nurses' Home at Hamilton

The City Council of Hamilton, Ontario, has approved of the erection of the New Nurses' Home, to cost $239,264. The Yates Construction Company's tender at that figure was accepted.

DETAIL OF ENTRANCE



DETAIL OF LOWER FACADE

NEW UNION BANK BUILDING, VANCOUVER, B.C.
SOMERVILLE AND PUTNAM, ARCHITECTS

Illinois Architects Question Contractors' Rights Arbitrarily to Fix Working Conditions & Wages

THE following communication was on June 1st forwarded by The Illinois Society of Architects to The Building Construction Employers' Association and The Associated Builders of Chicago:

Gentlemen:

We are advised that your associations have officially offered to renew existing trade agreements with the members of the Chicago Building Trades Council on the basis of $1.00 per hour for skilled labor, it being our understanding that all of the various trade agreements between your associations and the various labor unions expired yesterday by time limitation.

We are not unmindful of the fact that the execution of such agreements has in the past so operated as to make Chicago a closed city; that the actual operation of the agreements executed by your associations fixing working conditions, restricting the number of apprentices, the establishment of the principle of the job stewards, the closing of all avenues of employment in connection with all building operations to all other then memebers of the Building Trades Council of Chicago has so acted as to enhance greatly the cost of all building construction, largely through a gradual reduction in the amount of work performed per day by the mechanics of all trades. The increased cost of building construction due to the operation of these closed agreements, which have actually erected a Chinese wall around Chicago, has been variously estimated at from five to thirty-five per cent. We are of the opinion that all such closed agreements are against public policy and should not be renewed.

The Board of Directors of the Illinois Society of Architects at a special meeting held to-day directed the President of the Society formally to inquire of you by what legal or moral right your associations have presumed as your justification to negotiate with and to execute contracts fixing working rules and conditions as well as the rate of wage which will so operate as to compel the building public to abide by without the building public as represented by some organization being a party to said negotiations and agreements.

We, however, recognize that custom has sanctioned the making of agreements fixing the wage scale, working conditions, etc., and we therefore suggest that your existing official offers to the members of the Building Trades Council to renew existing agreements should at once be withdrawn, and that the Building Trades Council be officially advised by your associations that before any new agreements can be entered into that the interest most largely affected, the building public, must be consulted and its approval obtained, and while we assume that your associations do attempt to represent the public as best you may, yet we suggest that some organization or organizations representing more directly the building public than either the contractors' associations or the labor unions should be consulted in the making of all agreements both as to working conditions and as to the wage scale. Indirectly, the fixing of the rate of pay for skilled mechanics in the Building Trades as a matter of fact indirectly fixes the rate of pay for similar labor in the territory covered by such agreements and we question both the moral and the legal right of any association or organization to execute any agreements that either directly or indirectly fix the rate of pay which owners and investors in buildings who are not members of your associations will be compelled to pay without having been either directly or indirectly represented.

We at the same time earnestly desire some authoritative statement from your associations showing the justification of your offer to renew existing trade agreements on a $1.00 per hour basis and we venture the assertion that just as sound economic reasons may be advanced as to why the rate of pay for skilled mechanics for the coming year should not be more than 80 cents per hour as any reasons that your associations may be able to advance in justification of your offer of $1.00 per hour.

Owing to the general economic unrest, the stagnation in business, the admitted need for housing, the unwillingness of investors to proceed with work at present high costs, permit us to suggest to your associations the absolute need for a general revision of the working rules which have so operated as to limit output; that the elimination of all rules limiting output are equally as important as a general reduction in the wage scale, and we believe that the differential wage scale of previous years was more equitable than the wage scale submitted by you. We further suggest that the building mechanics be officially notified that if reasonable working agreements are not executed within a certain fixed time that your associations will feel justified in starting construction work under the American or open shop plan, which has been recently inaugurated in Pittsburgh, Cleveland, Boston, Philadelphia, Minneapolis, St. Paul, Atlanta, Youngstown, Memphis, New Orleans, Omaha, Portland, Baltimore, Washington, Dallas and other large cities.

We are convinced that if such a plan for new working agreements is put into operation that it will do much to restore conditions under which it will pay investors to build and aid in bringing about a general resumption of building operations.

Your associations must know that these are abnormal times and that construction work generally will only be started when builders and investors are convinced that they can secure a reasonable return for every dollar invested and when they can secure

a day's work for a day's pay at a wage rate that is believed to be fair and equitable.

Respectfully submitted,

Illinois Society of Architects.

By F. E. Davidson, President.

Commenting on the foregoing editorially, The American Architect states that the homely simile of "the tail wagging the dog" may be very correctly used in referring certain condition in the building trades all over the country. Naturally an industry so centrally controlled by organizations as building, it declares, will exert its influence wherever building is carried forward. It therefore applauds the aggressive attitude of the Illinois Society of Architects as placing the profession of architecture exactly where it belongs,—the dominating factor in every building operation, stating that its action is notable as an instance where a group of organized architects have thoroughly realized their responsibilities and duty to their professional brethren and the public.

Continuing in this connection, our contemporary goes on to say: The contention set forth in the communication of the Illinois Society that contractors have neither a moral nor a legal right to fix working condition and wages that the public will have to abide by without the public being fully represented in the making of such agreements, is absolutely sound. Such an arrangement is directly in violation of a constitutional right. If the construction organizations will invite the architects into their councils, the public will undoubtedly have more respect for these agreements, inasmuch as they will correctly feel that their interests in these matters will be fully protected by men who are competent to represent them.

A precedent of this sort was established when the National Board of Jurisdictional Awards was formed. In this Board the owners, investors and the building public are directly interested through the architects and engineers on the Board. Making the profession of architecture a third party to all agreements insures the elimination of the restrictive features that now adversely affect every building operation.

Labor having in the past secured through the influence of its voting power every law that it could demand, it is now time carefully to consider just how such laws affect the general interest and what further enactment there might be equally to insure the rights and privileges of the public.

Quantity Survey and Payment for Estimating

Report Adopted by Associated General Contractors of America, American Engineering Council of the Federated American Engineering Societies, and the American Institute of Architects.

THE purpose of this report is to acquaint prospective Owners and others financially interested in building and other construction projects with the wasteful duplication and consequent expense involved in the preparation of estimates of quantities under the systems now generally in vogue.

To ascertain the cost of a construction project it is necessary to determine and compile lists or estimates of the quantities of materials and work to be done, to which are applied a price for each item.—Under existing methods this work is done separately by as many Contractors as are permitted to bid, and there may be as many varying interpretations of a set of plans and specifications as there are bidders.

The recommended procedure of quantity surveying described herein is intended to eliminate the present wasteful and uneconomical methods by concentrating the function of determining and compiling the quantities and list of work involved, in one agency for each project. This quantity survey to be submitted to all bidders with the plans and specifications.

To Owners and Investors

It should be realized that all expenses in connection with the planning of buildings and construction are paid by the Owner. Those who contemplate building know that none can afford to work without fair compensation for services rendered, but they probably do not realize that, due to practices in vogue, they pay for the cost of preparation of all bids, including that of the successful bidder. Generally speaking it has been the practice to have the figures submitted by the successful bidder include an amount sufficient to cover the work entailed in making proposals on other work which he was not successful in securing; in short his "overhead" account is much larger than it necessarily should be, but for all this the Owner pays. To eliminate the duplication of effort in estimating, thereby reducing the Contractor's overhead with attendant reduction in the cost of building, requires that all bids be submitted on the same basis and in such manner that they may be readily analyzed.

The Owner should not be required to pay a Contractor an overhead charge which includes any other costs than belong to his own project. It is believed that this can be accomplished by having made an itemized list of all quantities entering into the proposed work.

The Owner should pay for the preparation of this itemized list whether he proceeds with the building or not. It is obvious that such payment will be much less when such itemized list is furnished than other-

wise, as each bidder is furnished with the list of quantities called Quantity Survey and each bidder is thereby released from the work of separately taking of the quantities from the drawings and specifications.

Speculation Eliminated

A quantity Survey, because it fizes definite quantities on which the bids are to be received, eliminates speculation on the part of the bidders as to the quantities involved in theproject and thus makes possible lower bids due to the elimination of this "contingency."

Where the Owner does not avail himself of the quantity survey procedure recommended herein, he should pay for estimating work direct to selected bidders on a prearranged basis, rather than have all his bids increased by an unknown amount for estimating quantities, which frequently in current practice the successful bidder distributes amongst the unsuccessful bidders in accordance with a prearrangement of the bidders.

To Architects and Engineers

With the idea in view of having all Contractors submit proposals on a uniform basis, with some means provided whereby the amount of the proposed work will not be left to individual interpretation of the plans and specifications, it seems most desirable that all Owners through their Architects or Engineers should have submitted to bidders, with the plans and specifications, a so-called Quantity Survey. To insure the result aimed at, no proposals should be considered other than those based on the quantity survey accompanying the plans and specifications. It is therefore, recommended to Architects and Engineers that, unless eliminated for some particular reason, all plans and specifications submitted to Contractors for proposals be accompanied by a quantity survey. It is further recommended that the selected bidder shall submit, before the contract is awarded, a copy of the quantity survey with each item priced and separate items added for costs of administration, etc., the total to make up the bid price.

To Contractors

It is evident that before an intelligent proposal can be made upon any project, the Contractor must have a quantity survey or some other statement of quantity involved. It has been customary in the past to add a stipulated overhead charge to provide for the cost of estimating and as this has been applied to every individual proposal made by the Contractor the successful bid, out of a possible fifteen or twenty, contains an item not strictly chargeable to such bid, and thereby penalizes the Owner. A quantity survey furnished to each bidder will reduce the cost of preparing proposals on prospective work, and not only should but obviously will reduce each bid price and thereby directly lower the cost to the Owner.

A quantity survey places all Contractors on the same basis, which is a definite one, from which they may price or determine the proper cost of the work. Each individual item or cost as set out in such quantity survey should be a basis of determining the proper cost of extra work desired by the Owner, as well as a basis for credits on account of omissions; it also has the added advantage of enabling contractors to audit and prepare monthly statements, progress reports, etc.

Recommendations

1. Quantity surveying—Architects, Engineers and Contractors should jointly use their efforts to have established facilities for making quantity surveys.

2. Payment for quantity surveying—The Owner should pay for the quantity survey from one-quarter of 1 per cent. to 1 per cent. of the cost of the project for commercial and public work, and not more than twice as much for residence work, whether the project is constructed or not.

3. The cost of the project be defined as the accepted bid, or in cases where no bid is accepted, the bid of the lowest responsible bidder as determined by the Architect or Engineer. However, in cases where alternate bids are required, the additional payments for the quantity survey shall be based upon the additional quantities surveyed, as approved by the Architect or Engineer.

4. Altered plans which involve a change in quantities after the quantity survey has been made justify an addition to the original fee for quantity surveying.

5. Basis of contract—Owners should have the option of—

(a) Making the quantity survey a part of the Contract, or

(b) Permitting the successful bidder, at his own expense, an opportunity to verify the accuracy and completeness of the quantity survey before the contract is signed. If he proves errors to exist in the quantity survey, the bidder shall be permitted to adjust his bid accordingly.

6. Unit quantities and standards—The schedule of unit quantities should conform to local customs or methods of measurement and should be so stated on the quantity survey. The eventual adoption of national standards is recommended.

7. Guarantee—The guaranteeing of quantities by a Quantity Surveyor is not recommended, for it might influence the Surveyor to protect himself by increasing the quantities. The extra cost of a guarantee would not be warranted.

8. Existing methods—The cost to Owners of preparing bids by existing methods, which make necessary wasteful duplication in estimating quantities by several bidders, is known to be much greater than the cost of preparing bids based on a quantity survey furnished by the Owner, and therefore such existing methods are condemned and should be discontinued.

GENERAL VIEW

DETAIL OF ENTRANCE
ALLEN THEATRE, VANCOUVER, B.C.
C. HOWARD CRANE, ARCHITECT

Some Problems in Theatre Construction

By Gordon L. Wallace, B.A. Sc.

SINCE the termination of the war two years ago, Canada has experienced a very decided boom in the construction of large and elaborately furnished theatres. A score or more of these amusement places have been built, or are in course of erec tion in points as widely separated as Montreal and Victoria, and practically every city and large town between has become possessed of one or more.

While it is true that no large building is ever designed or constructed which does not offer for solution some problems peculiar to itself, still it is probable that no type of building presents so many unusual features as does the modern theatre. It is with some of these peculiarities of theatre construction that the writer proposes to deal at the present time.

From the architect's point of view, the design of the theatre resolves itself into the securing of an absolute maximum of seats at a minimum of cost, limited only by the fact that it must attain to a sufficient degree of splendor, comfort and convenience to insure its fulfilling the function for which it was designed. Where the value of each seat can be computed in dollars per year, and where the aesthetic features are of paramount importance, it is not surprising that the actual details of construction are subordinated to the architectural requirements. This subordination of the engineering features frequently forces the engineer to resort to expedients which might almost be described as freak construction, but the result which the architect is able to attain in arrangement and beauty of his design more than justify the extra cost involved.

MEZZANINE—ALLEN THEATRE, VANCOUVER, B.C.

Roof Trusses and Supports

Probably the theatre roof differs less from the standard engineering practice than any other portion of the whole structure and yet, even the type of roof truss is largely determined by considerations which are peculiar to theatre buildings. It is customary, particularly in the larger houses, to make the main ceiling with a considerable crown and generally to accentuate this still more by forming the centre of the ceiling by a huge dome. As it would be decidedly uneconomical to carry up the side walls to any greater height than was absolutely necessary, it is, therefore, a common practice to design the roof truss with a cambered bottom chord making the camber approximately equal to the rise or crown of the ceiling. It is generally possible to locate two columns, one on either side at about 20 feet from the proscenium piers or curtain line, which will fall several feet inside the side walls of the theatre and yet remain hidden behind the organ screen and proscenium boxes. By thus keeping within the lot lines one is enabled to shorten the span of one truss and to carry the load upon concentrically loaded footings.

The other trusses may be made parallel to the truss which frames between the two above-mentioned columns or they may frame from this truss to columns contained in the rear wall of the theatre.

AUDITORIUM

PROMENADE

ALLEN THEATRE, VANCOUVER, B.C.

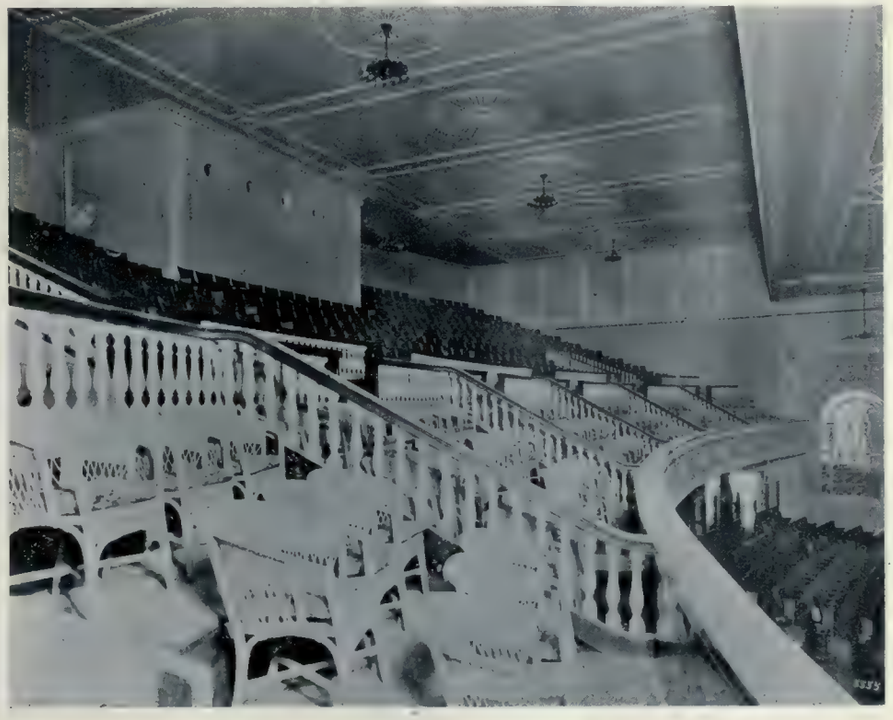
C. HOWARD CRANE, ARCHITECT

In either case, the columns must be contained in the outside wall and the difficulty is to avoid causing an undue eccentricity in the footings. Should it transpire that the rear theatre wall abuts upon a lane, it is often possible to arrange to spread the footings beyond the lot line, and thus avoid eccentricity entirely. Where this is possible, it becomes desirable to frame the truss in the direction which will allow of the load being thus provided for.

Where the decision is not influenced by the considerations above noted, the truss framing will be determined by investigating the combination of span and spacing which will result in the most economical design of trusses and beams. By framing all the roof trusses parallel, it is possible by allowing one beam to cantilever over a few feet beyond the truss at each end to considerably reduce the span of the adjoining beams. In this way a very considerable saving in roof steel is often effected. When it is impossible to arrange to have the foundations encroach beyond the lot line, and a very heavy concentration of load occurs at a point approximately one foot inside the building line, the maximum eccentricity permissible, if one is to keep the point of application within the middle third cannot exceed one foot, and even then the load on the heel will be twice the average. In order to overcome this difficulty, and at the same time carry the somewhat heavy side wall load, it is usually advisable to adopt a continuous reinforced concrete footing under the whole sidewalk.

Load Concentration on Walls

Though the concentration of load on the theatres side wall often merits special consideration, the very excessive loading on the rear and side stage walls is much more apt to occasion serious trouble. When one considers that these walls are frequently 70 feet high above stage datum and that the foundation would have to go down to minus fifteen or eighteen feet to get below the boiler room floor, it becomes apparent that the wall load alone may amount to about ten or eleven tons per lineal foot, to which must be added the stage roof and grid-iron loads. For conditions such as are here outlined, one has either to carry the foundation down to soil, having a safe bearing value of seven tons per square foot, or recourse may be had to special construction to provide for this load. In some cases piles may be used, or it may be possible to make a combined footing and use the proscenium load or a chimney or both proscenium and chimney to act as counterweights. One such case comes to mind where it was necessary to make a combined footing to carry a stage side wall, the proscenium pier and the chimney, and at the same time to under-pin the wall of an existing two storey brick building and carry the whole foundation down to fifteen feet below datum.



VIEW OF BALCONY—ALLEN THEATRE, VANCOUVER, B.C.

The proscenium opening affords another feature of unusual interest. According to the City of Toronto building codes, it is necessary to carry the proscenium wall over the opening on a steel truss, and also to turn an arch over the opening secured to the truss by skew-backs. This provision could only be necessary for slavage and is commonly neglected. On several recent jobs a heavy reinforced concrete girder has been used instead of the steel truss and found to be quite satisfactory. The reasons which make the reinforced concrete girder

desirable are three in number. First, there is, or at least there has been, the difficulty in securing delivery of steel. Second, the factor of cost, which may or may not be less dependent upon local conditions; and lastly, because it allows the general contractor to proceed with his work without waiting for the steel contractors to come and erect the truss. Where a steel truss is used the bricklayers have a high wall to build on the truss after the steel gang are on the job.

On the other hand, the steel truss is favored because it is lighter, bringing less load upon the proscenium piers and the top chord can be designed to insure a greater degree of lateral stiffness. This latter provision is important since the curtain prevents any lateral bracing on the stage side, and the form of the auditorium ceiling renders bracing impossible on the other side. When it is pointed out that frequenly the span may be 60-feet and that the load may approximate 500 tons, and yet it is impossible to provide a girder having a greater thickness than 26 inches, it is evident that considered as a column, we get a ratio of 1/r far in excess of any allowable limits. It should always be arranged to bring the load from a steel truss upon the pier at the level of the bottom chord. The practice of some engineers in saving steel by inverting the truss and loading the pier at the level of the top chord should be discouraged, since it causes a decided increase in height of the pier and the 1/d factor becomes excessive.

Balcony and Mezzanine Framing

The balcony and mezzanine frame are, of course, the points of greatest difficulty in theatre design. To avoid interfering with sight lines, it is essential that the construction of the balcony front be reduced to the minimum and the allowable depth of each beam and truss be determined very largely by architectural considerations. In order to obtain the required results, beams and trusses must be cantilevered over and through each other, and the whole balcony and mezzanine supported without allowing any column to come in front of the back row and seats in the orchestra. Care must, of course, always be taken to secure adequate anchorage, and this is made the more difficult at times by the necessity of framing around air ducts, stairs and open wells, which often prevent the running of the members back to the rear wall.

The location of the picture booth also influences the balcony framing, although the booth is more frequently suspended from the roof to hang over the rear balcony. It is at times located in front of the mezzanine and under the balcony. In almost all full-sized houses it is necessary to utilize the full height between mezzanine and balcony floor in order to obtain sufficient depth for the trusses. Where this is done, vomitaries and such other openings must be left in the trusses and the design altered accordingly.

One case in point might be cited where a whole full-sized balcony and mezzanine had to be carried where the depth of the mezzanine floor construction was limited to 20 inches and it was impossible to secure more than two through trusses across the theatre. The top chord of the front truss had to be bent down at each end, and the bottom chord of the rear one bent up, to allow the vomitary to pass over the front truss and under the rear one without interfering with the headroom. It was possible to make the front truss 13 feet deep, although several openings had to be left through it, but the rear one could only be seven feet deep despite the fact that the span was over ninety feet. In order to relieve the load on this shallow truss two trusses were cantilevered over the front, one as a fulcrum to pick up the smaller front balcony trusses, and these two cantilever trusses produced a considerable uplift on the rear truss thus materially reducing the bending moment. Owing to the open well and the air ducts in the mezzanine, a whole system of cantilever beams had to be devised and the system suspended by hangers from the balcony steel. The hangers had to be located to suit the architectural treatment and the mezzanine framing designed to suit the point of suspension. Many similar cases might be cited, but each theatre presents its own series of problems, the only point of resemblance being that in every case the engineer is expected to provide a satisfactory solution to the difficulty which the architectural design presents.

A Rapid Stone-Cutter

Machines for cutting marble and other stone have a pedigree stretching back to very early days in civilization and they still often bear the marks of their primitive ancestory. Recently, however, a British engineering firm introduced a type which more closely resembles a machine tool than the crude equipments with which our forefathers were content. It is intended mainly for cutting and moulding, but it may be used also for slab and block work. The stone to be cut is placed on a table surmounted by a saddle carrying a carborundum wheel or a "diamond saw," which runs at 1,200 revolutions per minute and is kept cool by streams of water. The diamond saw is built up by arranging individual diamonds in metal "saddles" on the rim of a disc. Each saddle is drilled from behind, the diamond inserted in the hole and electrically welded over, and then mounted on the rim. The metal covering the diamond is ground away leaving the diamond exposed. Wheels of this type make very rapid and efficient cutters of stone and the use of the machine is expected to lead to remarkable economies over the older methods.

To Invite Plans for War Memorial Hall

It is understood that competitive plans for a Provincial War Memorial Hall, to be built in Toronto at Queen's Park, and for a cenotaph to be erected on University Avenue, will shortly be called for by the Ontario Government.

Wage Reduction Recommended at Toronto Conference

FOLLOWING a conference held in the offices of the Canadian Manufacturing Association on July 14th, nineteen building trades unions in Toronto are at present considering a proposal recommending a voluntary wage reduction of 10 cents an hour to become effective on July 25, with the results unknown at the time this issue of CONSTRUCTION goes to press.

The conference, which was called The Toronto Builders' Exchange and Construction Industries, was presided over by Senator Gideon Robertson, Federal Minister of Labor, and was attended by representative contractors, architects and dealers in building supplies. Its object was to promote a frank discussion and interchange of viewpoints in hope that interests suffering from depression in the building trades might through mutual consideration decide upon a programme which would stimulate building and restore the industry to normal conditions.

During the meeting the seriousness of the situation as it exists was emphasized by various speakers. President Herbert E. Moore, of the Ontario Association of Architects stated that Toronto architects alone had in their offices plans for work amounting to over $8,000,000, that was being delayed owing to unstable conditions prevailing at the present time. It was further pointed out at the conference that Canada could not look forward for any improvement in the matter of export business for some time to come, and that prompt steps must be taken to better conditions throughout the country if a period of business stagnation and widespread unemployment was to be avoided.

In view of the facts presented, the decision of the nineteen building trades affected, which will be submitted at a second meeting, to be held on July 25 at the Toronto Builders' Exchange, will be of utmost importance. If the proposal of a wage reduction is favorably voted on, new agreements will be drafted which, it is felt, will do much to move contemplated work forward. At this meeting the manufacturers and supply dealers, who took part in the previous discussion, will also bring in every possible suggestion to further reduce material costs.

In the meantime, a committee representing the manufacturing and contracting interests are conferring with the Canadian Freight Association to secure a revision of freight rates, and have decided, if necessary, to make application to the Board of Railway Commissioners for an entire revision of rates upon commodities used in the industry. This action was based on a resolution adopted at the meeting, which read as follows:

"Resolved, that in view of the necessity to reduce construction costs and in view of the large part played by freight rates in the delivered cost of low-value, heavy-loading building commodities, that this meeting should appoint a committee to confer with the Canadian Freight Association, and, if necessary, make application to the Board of Railway Commissioners for a complete revision of freight rates on these commodities in order to stimulate building by reason of lower delivered prices."

Regarding the question of lower wages, the resolution adopted by the conference set forth:

"That in as much as figures have been presented at this meeting to show that material costs are rapidly declining, that costs of living are also rapidly declining, and that a reduction in wage rates as suggested below can be put into effect without in any way lowering the present standard of living:

"Therefore, be it resolved, that the nineteen representatives from the Building Trades Unions take back to their respective Unions the suggestion that a voluntary reduction of 10 cents per hour be put into effect on July 31.

"Further, that another meeting be held between these nineteen representatives and the Builders' Exchange on Thursday morning, the 25th inst., at 10.30 o'clock in the Builders' Exchange rooms, to conclude the agreement.

"That the building material manufacturers be present at the same meeting to bring in all and every suggestion possible to further reduce material costs."

Those who attended the conference and spoke for the various interests represented were:

John M. Scott, the Builders' Exchange and Construction Industries; Peter McMichael, the Dominion Radiator Company; Fred Armstrong, the Port Hope Sanitary Manufacturing Company; J. B. McFarren, Interprovincial Brick Manufacturing Company; E. F. Waterman, Toronto Brick Manufacturing Company; J. B. Carswell, Carswell Construction Company; R. J. Fuller, John V. Gray Construction Company; J. P. Anglin, Anglin-Norcross Company; W. E. Dillon, Dillon Sheet Metal Company; George Clapperton, of the Bennett-Wright Company, sanitary and heating engineers, and W. Jenoves, T. A. Woods, J. Bird, Ernest Ingles, James Marsh, John Doggett and Frank Ball, for the Building Trades Unions.

Dealers in builders' supplies took the view that little could be done in reducing prices, which had been brought as low as they possible could. They believed, however, that a reduction in wages would have the effect of reducing prices. Their principal contribution to the discussion was the suggestion that the Board of Railway Commissioners revise freight rates on building materials. One of their members announced that the company he represented had, only recently, made another reduction in the price of brick.

The Union representatives insisted upon co-operation from the dealers in builders' supplies if they were to ask their organizations to accept a voluntary reduction in wages. They contended prices in some lines at present were still much higher than in 1914.

Uncompensated Services

During recent discussions of the Council of the Ontario Association of Architects on matters pertaining to the ethics of the profession, the attention of the members was directed to the somewhat prevalent and altogether undesirable practice of offering gratuitous services.

In this connection a letter was sent out stating that it was recognized by the Council that if the aims and objects of the Association was to be attained and lived up to, it was necessary to maintain among the members a proper professional spirit and a recognition of their obligations to the profession. The letter read in part as follows:

"The seeking out of a possible client and the offering to him of professional services on approval and without compensation, unless warranted by personal or previous business relations, tends to lower the dignity and standing of the profession and is to be condemned.

"Not only is it poor ethics, but it is undoubtedly 'bad business,' and is not at all conducive to the proper and equitable relations which should be established between an architect and his client. It has been the experience of men in practice for many years and their observation of the practices of other men, that sort of thing does not, and never will, pay in the long run.

"Every time an architect follows this procedure it makes it more difficult for him to receive remuneration on the next occasion, and gives the client a false and mistaken impression of architectural practice in general.

"This Association has endeavored at all times in its history to maintain a high standard of practice and conduct on the part of its members as safeguard to the financial, technical and aesthetic interest entrusted to them, and the Architects' Bill introduced in the recent sitting of the Legislature seeks to give the practice of architecture in this Province a status commensurate with high business capacity and artistic and structural ability, but if in face of this effort we are confronted with practices which tend to discredit and lower the standard, then it must be apparent that we cannot consistently hope for success or public support."

It is the intention of The Council to issue another letter shortly, dealing with the subject of ill-conducted and un-regulated competitions.

Brick Plant at Whitby, Ont.

Arrangements are being made for the establishment of a plant at Whitby, Ont., for the manufacture of a special type of face brick, according to Messrs. Baines and Ireliving, who are interested in the venture. The intention is to make bricks in several different colors and shapes. It is claimed for the product that the face is waterproof, and that the brick are consequently washable. Interior brick as well will be manufactured.

Cannot Match Stone in Rheims Cathedral

A new problem has arisen in connection with the restoration of the Rheims Cathedral. The peculiar kind of stone used in the erection of certain portions of the building during the thirteenth century is showing signs of disintegration, probably due to the constant subjection to poison gas and shell fire during the war. It is feared that, for this reason, important sections of the walls may collapse.

It was generally believed that the whole cathedral had been built out of limestone taken from the Rheims Mountain, but it is now learned that the thirteenth century work was all done with a peculiar alluvial rock formation, brought from Fismes, which is known as "Roman block." When polished, this Roman block took on a rose gold surface in which small fossil formations could be detected.

Seven hundred winters, centuries of rain-storms, had left this stone practically undamaged, until the German war gas began its destructive work. Thus far, however, geologists have been unable to find more of this Roman block for the repairs which, if done with ordinary stone, would detract from the beauty of the structure.

Restrict Housing Loans to $3,000

The Housing Commission of Welland, Ont., recently passed a resolution that no larger loan than $3,000 will be allowed hereafter on any house erected under regulations of the Commission. The Commission has taken this step to safeguard the financial interests of the city. The city guarantees the security of the loans to the Province, so the city itself, the Comissioners hold, should be amply secured against loss. With the building prices falling, property values will fall too, and the margin of safety for the city must be increased. The Commission still has $45,000 to loan at five per cent., when this amount is exhausted further funds will be loaned at six per cent.

O. A. A. Honour Roll

A special committee, appointed by the Council of the Ontario Association of Architects, is at present engaged in securing information for the preparation of a suitable honour roll of members who served in His Majesty's Forces during the late war. A questionnaire has been sent out requesting the name, rank and unit of those who joined the colors, together with such further particulars as will assist in preparing a complete and accurate list. The intention is to have the names on the honour roll arranged alphabetically, with the names of the fallen suitably accentuated.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER; LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO, - - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager

BRANCH OFFICES:
MONTREAL—171 St. James Street
C. S. Soutter, Representative.

WINNIPEG—336 Qu'Appelle Street
F. C. Pickwell, Representative

NEW YORK—505 Fifth Avenue
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements much reach the Head Office not later then the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.
Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, July, 1921 No. 7

The Ontario Architects' Bill

After a number of previous attempts, the Ontario Association of Architects have again presented a bill to the Legislature, seeking to establish a legal status for members of the profession practicing in the Province. The bill as drafted entirely eliminates any clause to make the profession a "closed corporation," which has hitherto been the main objection to a measure of this kind being passed. It merely seeks an enactment which will result in the appointment of a Registration Board responsible to the Government, to determine the qualification of those taking up architecture as a profession. Apart from giving encouragement to those who are capable of producing practical and artistic results, the Act as proposed is a measure which is essentially in the interest of the public. To-day in many cases a prospective owner has no way of determining as to who is, or who is not, competent to design his building. He may be fortunate in this respect, or again he may not, with the result that he finds he has made an unsatisfactory and costly investment. It is therefore the duty of the Government to establish a standard qualification which will protect the community and enable an investor to select men whose knowledge and training not only qualifies them to render services in architectural design, but who are capable of protecting his interests by giving him the utmost value for his investment. With any attempt at class legistlation removed there is no reason why such legislation should not be passed and it is much to be hoped that the bill as presented will not receive a prefunctory reading, but that at the coming session the act will be approved and placed on the statutes.

Town Planning at Toronto University

A series of lectures in town planning is being arranged by Prof. Adrian Berrington, of the Department of Architecture, as part of the extension course to be offered this coming year at Toronto University. This course will be held during the month of January next and as tentatively outlined will deal with the economical aspects of housing and civic planning, and be so arranged as to make a special appeal to architects, surveyors, municipal engineers, landscape gardeners and others, technically equipped, who wish to make a further study of such problems.

It is the intention to have two lectures followed by discussions on each morning of the two weeks' the course is in progress, and to devote the afternoon periods to a study of actual problems.

Prof. Berrington who will be in charge of the course joined the faculty about a year ago, and is an authority on the questions of municipal developments. It is understood that he will have the co-operation of several other members of the University staff, including Professors J. A. Dale, R. M. McIvor, W. M. Tredgold, in making the course attractive and instructive.

The course will be supplemental to the lectures previously delivered at the University by Mr. Thomas Adams, town planning adviser to the Federal Government, and in view of the present stage of Canada's development and the need of a more thorough grasp of city and town planning, it is hoped to make the subject a permanent feature of the curriculum.

Zinc for Roofing

An eight-page booklet setting forth the merits of "Horse Head Zinc" for leaders, gutters, valleys, flashing, ridge rolls, etc., is being mailed to the trade by the New Jersey Zinc Company, 160 Front Street, New York City.

A Fine Bronze Casting

In the difficult art of bronze casting few have attained the measure of skill shown in the accompanying tablet produced by the Canadian Wm. A. Rogers, Limited, Bronze Foundry. This fine, dignified tablet, clean and chaste in design, and a remarkable example of relief work, is typical of many fine bronzes turned out by this concern in the last few years. One solid casting, measuring 72 by 49 inches, and weighing 500 pounds, it is one of the largest pieces of art bronze in the Dominion. The relief in one part is five inches. It is a point worthy of national pride that Canadian craftsmen have reached so high a standard both in the design and actual casting of sculptural and architectural bronzes, as is exemplified in the exceptionally fine character of this firm's work.

SOLID CAST BRONZE TABLET ERECTED IN MEMORY OF THE FALLEN OFFICERS AND MEN OF THE ROYAL CANADIAN DRAGOONS.

Well-known Steel Works Under New Name

The Canadian Chicago Bridge and Iron Company, Limited, of Bridgeburg, Ontario, and Montreal, Quebec, has changed its corporate name to Horton Steel Works, Limited, according to an announcement made by C. H. Scheman, general manager of the company.

The new name has been selected in honor of the late Horace E. Horton, who founded the organization in the United States in 1865. The Canadian organization was first incorporated in 1913 and the plant at Bridgeburg, Ontario, was constructed in that year.

Mr. Horton was one of the pioneer engineers of North America. Starting with a timber bridge at Orinoco, Minnesota, in 1865, Mr. Horton developed a large business in the design, fabrication and erection of bridges, steel tanks, etc. In the early nineties, he revolutionized the steel tank business by inventing the hemispherical-bottom elevated steel tank of which thousands are now in use throughout the world. A few years ago his son, Mr. George T. Horton, now President of the Horton Steel Works, Limited, invented the elliptical bottom tank with riveted steel riser which was a further advance in the art of steel tank building.

The corporation has supplied the railroads and many industrial organizations of Canada with plate metal products. The company has a tried organization with its own operating officials, a complete plant, erection forces and contracting organization. In addition to Mr. Scheman, Mr. G. S. Sangdahl is district sales manager at Montreal, Mr. C. C. Gregory is manager of plant, and Mr. F. E. Gregory superintendent of erection. The main office and works are at Bridgeburg, Ontario.

Profiteers Forced to Build

Switzerland has found a new use for war profits. The Swiss who reaped an excess profit during the war can get an abatement of taxes if he will invest his surplus in residential housing under official regulation. The regulation guards against unsightly and unsanitary building. It also restricts rentals to yield only a fair return on the investment. If the war profiteer does not care to put his easy money into this useful channel of public service at a fair return, the state takes a large part of it from him and itself subsidizes the building of homes.

Land Subsidence and Its Effects

(*Continued from page 205*)

definite information is available for the use of designers.

For building on ground of low bearing value spread footing or raft foundations are often used, in which case care must be taken to distribute the load equally, so that subsidence, if any, will take place uniformly. An unequal settlement will throw the building further towards the overloaded side, and thus cause still greater movement, which, to a structure of considerable height, might prove fatal.

Reinforcement of the "raft" is a steadily growing practice, and has proved successful in many cases. The steel may be placed in the body of the mattress, as slab reinforcement, or, more efficiently, between the column bases in beams or cantilevers formed in trenches of the desired dimensions cut in the foundation bed.

In calculations to determine the bearing area for building the live load must not be neglected. A convenient method of calculation is to consider the footing in which the live load bears the highest proportion to dead load, and to note the area needed to support its total load at the allowable unit-bearing value. From this, neglecting now the live load, we can calculate the dead load per unit area of the footing, and adopt this as the unit for the calculation of areas required for the other footings.

Pile foundations are often abused, and sometimes placed where absolutely useless. A pile driven down to a material of good bearing capacity will sustain its load as a column, but when a suitable bed is too far distant a pile may be driven for a length into a weak soil, when it will transfer its load by skin friction. By the bulb of pressure it has already been shown that a certain number of piles will load an area to its maximum and extra piles, to be of any service whatever, must be driven outside that area to create a larger zone of resistance. Although piles will bear a high vertical thrust, they are weak laterally, since they are easily forced through the soil, and serious failures have occured on account of lateral pressure, such as might be expected with a retaining wall. Piles should therefore be driven in the line of resultant pressure.

In soil of a compressible nature it is seldom that a building maintains its original foundation level, but such slight subsidence is not to be feared if it is uniform, and it is a growing practice to expect a small settlement and make allowance for it. An effort should therefore be made to tie a building well together, and make it act more as a unit than a collection of disjointed parts. Reinforced concrete is by nature an ideal structural material under such circumstances.

CONCLUSION

By this short summary of the various causes of subsidence, the author hopes that attention will be directed to the need for a closer study of the subject, and that from this a more confident practice will result.

It is easier to brace an excavation adequately than to be obliged to rebuild a street of ruined houses.

It is more economical to investigate a foundation bed thoroughly and to design sound footings than to underpin weak footings after their failure.

Allowance must be made for any "natural" change of state which might occur, for otherwise a design may prove inadequate to meet new conditions.

Where trouble occurs it is due in a great many instances, to water action. Good drainage, therefore, is a key to safety.

It has been said of foundation design that, unlike most other engineering calculations, it pays little heed to a safety factor, but it now seems far more possible that this highly desirable working margin may be economically obtained by the more extensive use of reinforced concrete in foundations.

Saving Worn Machinery by Nickel

The high cost of iron and steel has stimulated engineers to develop efficient means of restoring parts which have become so worn that they are fit only for the scrap heap. A typical example is an engine crank shaft, which after a certain degree of wear, gets out of line to such an extent that it is useless. Welding has been largely used in the work of restoration, fresh iron or steel being welded on to the worn parts, and the whole then made true in a lathe. There are objections to this process in certain cases, and in order to overcome these objections a British engineer has developed a method of depositing nickel on the worn parts. The piece of machinery to be treated is first made free from grease and dipped bodily into a bath of molten wax. After the wax has cooled it is removed from the parts which have to be restored and is left on the others as a protective covering. Cleaning in a bath of acid is followed by immersion in an electro-plating bath which deposits nickel on the exposed surfaces. The coating of nickel is extremely hard, and when the process is properly carried out the nickel adheres with remarkable tenacity to the metal on which it has been deposited. Crank shafts, spindles, axles, pistons and similar objects can be made quite serviceable again by the nickel layer at a cost below that of replacing the whole part. Deposits up to one-eighth of an inch can be applied successfully. It is expected that this process will be developed alongside the welding processes which have been brought to so high a pitch of usefulness in many repairs, such as the mending of cracked or broken castings, which could not be handled by the deposition of nickel.

Dissolves Partnership

Mr. J. P. Hynes announces the dissolution of the firm of Hynes, Feldman & Watson, Architects, owing to Mr. Feldman's death, and Mr. Watson having gone with Warren & Wetmore, Architects, New York City. Mr. Hynes will continue practice with offices at 73 King Street West, Toronto.

Contract Awarded for Mount Royal Hotel

The contract for the new Mount Royal Hotel to be built on Peel Street, Montreal, has been awarded to the Thompson Starrett Construction Company, of New York City. The building will be ten storeys high, 253 by 209 feet and will cost $8,000,000. It will contain over one thousand bedrooms. Ross and McDonald, Montreal, are the architects.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in this Issue

NEW UNION BANK BUILDING, VANCOUVER

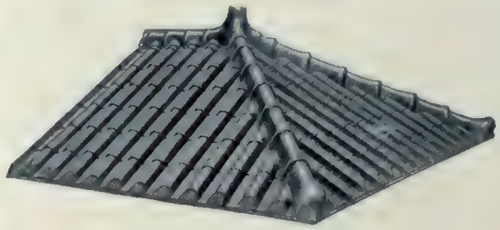
General Contractors	Hodgson, King & Marble
Plumbing Contractors	Barr & Anderson, Ltd.
Heating and Ventilation	Leek & Co.
Electrical Contractors	Munday, Rovlard & Co.
Cut and Carved Stone Work	C. A. & C. E. McDonald.
Modelling for Stone and Metal Designs, also Wood Carving	C. Marega.
Bank Fittings	Cornish & Cooper.

J. P. Anglin, B.Sc., President — *H. J. Gross, Vice-Pres. & Treas.* — *C. D. Harrington, B.Sc., Vice-Pres. & Manager.*

ANGLIN-NORCROSS LIMITED

CONTRACTING ENGINEERS AND BUILDERS

MONTREAL TORONTO WINNIPEG



Spanish Tiles

The Roofing of Distinction

To the color and distinction of contour of Spanish Tile may be attributed much of the charm of many Old World and Spanish-American buildings. Metallic Cluster Spanish Tiles supply that distinctive type of roofing in a material suited to the extremes of Canadian climate.

They are a replica of Spanish clay tiles.

Designed in cluster, they are easily and quickly applied, and with a minimum of joints.

Ask for Catalogue "N"

The Metallic Roofing Co.
Limited
Manufacturers

TORONTO, WINNIPEG

VENTILATE YOUR PLANT

Efficient work depends largely on the health of your employees. No man can give his best when the room in which he works is filled with foul air, gasses, etc. These can best be removed by using the "BURT" Ventilator—the most approved type of ventilator on the market to-day.

There's a "BURT" to meet every requirement—let "REED" Engineers solve your ventilating problems.

A consultation involves no obligation.

Geo. W. Reed & Co Limited, Montreal

Solignum — Wood Preservative—Shingle Stain—supplied in special grades for interior woodwork. Made by Major & Co., Limited, Hull, England.

PARIPAN — The finest enamel for plaster or wood; flat or gloss, in colors. Made by Paripan Limited, London, England.

FLINTEX — Concrete hardener—makes floors frost, dust and wear-proof. Made by us here.

STURGEONS — French Polish Wax—the best wax on the market for all purposes. Made by us here.

STURGEONS LIMITED BRITISH PAINT SPECIALTIES 64-66 RICHMOND STREET E., TORONTO

Toronto, August, 1921 Vol. XIV., No. 8

CONTENTS

LANDSCAPE ARCHITECTURE 225
By Arthur M. Kruse, M.A.S.L.A.

PROFESSIONAL PRACTICE IN LANDSCAPE ARCHITECTURE 234

WASTE IN THE BUILDING INDUSTRY 236

"KAWANDAG," SUMMER HOME OF SIR JOHN C. EATON, ON LAKE ROSSEAU 242

C. A. A. COUNCIL PROCEEDINGS 246

QUESTIONAL COMPETITIVE METHODS 247

FACTORY OF PREMIER TIRE AND RUBBER COMPANY, BEAMSVILLE, ONT 249

MEMORIAL AT HAMILTON (ONTARIO) ARMORIES 250

EDITORIAL 251
R. A. I. C. and O. A. A. to Discuss Issues Jointly.

CHINESE ARCHITECTURE 252

FRONTISPIECE:

LANDSCAPE WORK, RESIDENCE AT HAMILTON, ONT 224

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

GLIMPSE FROM SUN ROOM

GLIMPSE FROM STREET

RESIDENCE AT HAMILTON, ONT.

GORDON H. HUTTON, ARCHITECT
W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS
ARTHUR M. KRUSE, ASSOCIATE

Landscape Architecture

By Arthur M. Kruse, M.A.S.L.A.

"Landscape Architecture is the art of fitting land for human use and enjoyment."

IN CANADA and the United States the term Landscape Architecture, as used to-day, covers many broad fields of endeavor. The profession includes the design, arrangement and the direction of development, of land and the objects upon it, in connection with private grounds and gardens, institutions, public parks, playgrounds and squares, cemeteries, streets, and parkways, residential communities, and problems of city and regional planning. Of the various phases of the art mentioned, the problem of private grounds and gardens, or in other words domestic landscape architecture will alone be discussed in this article.

JAMES NICHOLS, ARCHITECT.

W. E. HARRIES, AND A. V. HALL, LANDSCAPE ARCHITECTS ARTHUR M. KRUSE, ASSOCIATE.

SCREEN PLANTATION, ESTATE OF E. R. WOOD, ESQ., NEAR TORONTO.

In England the use of the term Landscape Architecture is gaining, but domestic landsacape architecture, often spoken of as landscape gardening, has fallen largely to nurserymen, the scope of their operations being limited to the horticultural phase only, and a commercial rather than an aesthetic spirit is the incentive. This is an added reason for maintaining the term landscape architecture, implying as it does, in private work as in all others, far more of design and composition than gardening and horticulture. The profession is a technical one, not an adjunct to, but co-ordinate with the profession of architecture. The qualifications, aesthetic taste, creative ability, and executive skill, are its fundamentals.

Domestic properties could well be divided into say three types, namely large and small city grounds and suburban estates; the latter usually affords opportunities more elastic and of greater scope than any other type. At various stages of the development of suburban estates the expert advice of the professional landscape architect is usually solicited, but unfortunately such advice is often not secured until some definite problem is encountered and a vain attempt has been made to straighten out the difficulty. The inception of the idea to establish a suburban estate should immediately suggest to the investor the necessity of expert advice in regard to the acquisition of property. Such considerations as environment, ease of access and possibilities of economic development must be weighed on one side against monetary values on the other. Economic development would depend upon existing assets such as satisfactory building sites, natural landscape features and soil conditions.

Prior to any development whatsoever, accurate and extensive surveys should be procured of boundaries and topography of the property, and delineated according to scale in plan form. By topography, is meant, the location of existing buildings, wooded areas, specimen trees, land contours, water courses, rock outcrops, land drains, etc., in fact, everything existant of material importance. Upon the completion of the topographic survey, the preliminary data is available for activity in the way of constructive development; the question of design follows and is of paramount importance.

Later on as the development is being carried out, this topographic map forms a basis on which to record such installations as that for sewer, water, drainage, etc., and which can be used as a plan of record for the superintendent or the owner, in mak-

ENTRANCE TREATMENT
ESTATE OF E. R. WOOD, ESQ., NEAR TORONTO, ONT.
JAMES R. NICHOLS, ARCHITECT
W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS
ARTHUR M. KRUSE, ASSOCIATE

ing additions or repairs to the systems after the estate has become established.

The owner, including of course not only the master but also the mistress of the proposed estate, undoubtedly has some preconceived development in mind according to observations or experience with similar undertakings. However, expert advice is required and upon the successful co-operation of the owner, architect and landscape architect, depends the ultimate satisfaction to all concerned. It is the business of both experts to receive the opinions and ideas of the owner and to place at their client's disposal their technical training and experience in the way of constructive advice and sound criticism, to the end of assisting the owner in obtaining the use and effect which he desires. It has occasionally been suggested by inexperienced apprentices that the landscape architect should dictate or make final decisions as to not only the residence site, but also the nature of the medium to be utilized as building

A GARDEN "OVERLOOK" IN DETROIT.

VIEW ACROSS LAWN

A SLOPE TREATMENT
RESIDENCE, DUNVEGAN ROAD, TORONTO
C. S. COBB, ARCHITECT
W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS
ARTHUR M. KRUSE, ASSOCIATE

VIEW OF ENTRANCE DRIVE
ASHBURNHAM ESTATE, OAKVILLE, ONT.

material and the style of architecture best suited to the site. The absurdity of such an impression is apparent; the co-operation, mentioned above, of each in his own field, will with very few exceptions make such decisions unanimous.

The selection of the building site and all subsequent planning are carefully moulded into one comprehensive scheme for the harmonious and economic development of the property as a whole, such a scheme only being arrived at after an exhaustive consideration of every apparent possibility. The questions of elevation, exposure, and prevailing winds and the consideration of natural landscape features and proposed landscape embellishment must be satisfactorily adjusted in the disposition of the architectural unit or group. Likewise in the treatment of the landscape itself, the architectural composition is necessarily the focal point.

The question of the development of surbuban estates naturally suggests such properties which have long been established in England; uniformity of climatic and atmospheric conditions, together with economic conditions during the last century have produced horticultural compositions unequalled in variety and beauty. However, in Canada and the United States to-day very few localities offer like possibilities, variations in climatic and soil conditions are very pronounced. For instance, Kawandag, the estate of Sir John Eaton, at Rosseau, Ontario, in the Muskoka Lake region, required development according to the peculiar geological conditions which prevail in the locality. In comparison, estates in Oakville, and the surrounding territory afforded possibilities of a decidedly different nature.

Adjacent to Toronto at the north-east, an estate for E. R. Wood, Esq., has been under construction since the fall of 1920. The procedure of development previously discussed, is being closely adhered to and the results thus obtained are proving decisive.

The property when acquired was a farm under cultivation, divided into two distinct areas, one portion situated on a high plateau above the Little Don River, the other occupying a relative position in the river valley basin from seventy-five to one hundred feet below. Accurate boundary and topographical surveys were prepared and it was discovered that a public highway leading across the valley on a very steep grade cut the property into two parts. Overtures were made to the proper authorities to consider the closing of the road in question, and to divert the public highway along the outskirts of the property where a much easier grade could be established. This was ultimately accomplished, thus joining the estate into one complete parcel.

In this particular instance the choosing of the site for the residence resolved itself into a determina-

THE LAWN
ASHBURNHAM ESTATE, OAKVILLE, ONT.
CHAPMAN AND MCGIFFIN, ARCHITECTS
W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS
ARTHUR M. KRUSE, ASSOCIATE

tion of a point on the high plateau which would command the most extensive view of the Valley, and would at the same time lend itself to a comprehensive scheme for the development of the surrounding areas. Numerous consultations between the client, the architect and the landscape architect were held on the property and various schemes were devised for the development of different sites. By a process of practical elimination the site for the residence and its governing floor levels based on drainage studies were definitely and finally determined.

Although it was not intended to get the residence under construction until the Spring of 1922, it was thought advisable, taking the element of time into consideration, to get certain landscape improvements under way. The plans for the residence and and auxiliary buildings were proceeded with by the architects in accordance with the general layout decided upon in the selection of the site. The layout as planned placed the residence very close to the abrupt brow of the plateau previously mentioned, terminating a proposed entrance drive approximately a quarter of a mile in length from Bay View Avenue, the public highway extending along the west boundary of the property. The architectural group as planned will consist of residence, garage, and chauffeur's cottage forming two sides of an entrance court. The third side is balanced by a colonnade in harmony with the architectural treatment of the buildings, which together with the east end of the residence will form focal points in the layout of formal gardens to the east of the residence. At the entrance to the property from Bayview Avenue, simple but impressive entrance gates were planned for, and constructed during the Spring of 1921. To the south of the entrance drive and in close proximity to the gates, a lodge, or gardener's house is contemplated.

The entrance drive as constructed leads from Bayview Avenue, on long sweeping curves through the orchard and emerges into an open meadow area before meeting the turn provided for in the court formed by the architectural group of buildings. To provide vehicular access to the farm building group and property on the lower level, the main drive continues on from the fore court at a narrower width to the extreme brow of the plateau at the east, which it skirts in a considerable cut, and continues down along the face of the bank on a feasible gradient. The variety and extent of valley views obtained by this road are numbered among the features of the estate. An exhaustive study into the problems of location of grades and storm drainage of the entire upper level was necessary in the layout of the drive system as constructed. The actual road metal of the main drive is sixteen feet in width and constructed of Tarvia macadam; turf gutters three feet in width are pro-

VIEW ACROSS LAWN, ASHBURNHAM ESTATE, OAKVILLE, ONT.

vided for on either side of the drive together with catch basins at necessary intervals for the collection of surface drainage. A system of sub-surface drainage was likewise installed. At the point where the drive emerges from the orchard, a service road twelve feet in width branches, and will lead to a service court adjacent to the architectural group on the west side.

As stated previously, at the beginning of operations in the late Fall of 1920, the land on the upper level was utilized for agricultural purposes and was with the exception of an apple orchard at the west end, entirely open land. A program and estimates of construction were compiled, consisting of road building, road side planting, screen plantation work and tree preservation. During the Winter months operations were limited to grading, drainage, large tree planting, tree preservation work and the transportation of road materials to the property.

HUBBELL & BENNES ARCHITECTS

WARREN H. MANNING LANDSCAPE DESIGNER

The service yard in connection with the residence on the abutting property at the south was a feature to be subordinated and the formation of a screen seemed desirable. Likewise along Bay View Avenue, a large existing evergreen hedge did not extend beyond the north side of the entrance gate. To establish a screen plantation to overcome the former and to extend the hedge for symmetrical arrangement on either side of the entrance gate, Winter planting was resorted to in the way of moving large deciduous trees and evergreens. An immediate effect has thus been possible, the accompanying photographs illustrating the results which have been obtained from plantations established since January 1, 1921.

Such immediate effects as have been mentioned above are the exception rather than the rule in the practice of the landscape architect. It most often happens that he is called upon to plan for decorative effects which he must visualize at the time of planning. The effects of his planning in its completion will not be apparent to the ordinary observer for several years' time. The illustrations of "Ashburnham" and "Raymar" estates at Oakville, that of J. H. Wade, Esq., and the Old Mill Tea Gardens, near Toronto, show this effect of time most clearly.

VIEW ACROSS POND TO RESIDENCE, J. H. WADE, GATES MILLS, OHIO.

Ashburnham Estate was laid out in 1914. The shrub plantations along the driveway were established by the use of the ordinary commercial sized nursery stock, and a few native Arborvitae. The lawn area as seen in the illustration was a bare field, and the trees which now exist were all moved from neighbor-

ing woods. The Wade Estate at Gates Mills, Ohio, was completed ten years ago, the pond in the foreground was formed by damming the ravine in what was then a field, and the lower plantations shown in the illustrations are all the result of landscape treatment and subsequent growth. The same service rendered by the landscape architect in the suburban estate is required in the development of the large or small city grounds. The difference between the requirements for each is that in the former, space is usually available to permit of a free treatment, and points of interest exist either because of the topography or other natural conditions. The area immediately surrounding the residence is treated either formally or informally, depending upon which treatment forms the best means for transition in feeling and appearance from the residence itself to these natural features.

VIEW OF POOL: A GARDEN IN ROSEDALE, TORONTO
W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS
ARTHUR M. KRUSE, ASSOCIATE

In planning the city grounds the problem is one of intensive development. The landscape architect must give the greatest variety of interest possible in what is often a very restricted area. In order to do this a well ordered treatment utilizing every foot of space is required, with the result that the design and the materials used to provide interest are often more architectural than horticultural, as the city grounds represent in a way, one or more out-of doors rooms to be used in conjunction with the residence. To what length the development of these details go rests largely upon the wishes and tastes of the client.

The development of the same plan outline can almost be said to permit of two distinct treatments, one effect made by the use of architectural detail and in the selection of the materials for steps, paths, fences, statuary, etc.: and the other by the use of horticultural materials only. The first would be a formal garden in the fullest meaning of the term, and the second would be only an orderly arranged flower garden. In the former the assistance and co-operation with the architect is invaluable. The latter is an arrangement of horticultural masses in designed groups. The accompanying illustrations of "A Garden in Rosedale," "A Garden Overlook in Detroit," and the grounds at the corner of Dunvegan and Lonsdale Roads illustrate fairly well the difference mentioned above. The illustrations of "the Hamilton Residence," the "garden on Roxborough Drive," and the pool at "Raymar," show a combination of architectural and horticultural treatment.

These are some of the more recent examples which have been brought to a point of satisfactory development, and tend to show the present progress of landscape architecture, particularly in Canada.

DETAIL OF GARDEN STATUE, ILLUSTRATED ABOVE

VIEW OF GARDEN

VIEW OF LAWN

RESIDENCE ON WHITNEY AVENUE, TORONTO

W. F. SPARLING, ARCHITECT

W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS

ARTHUR M. KRUSE, ASSOCIATE

VIEW OF PAVILION

ENTRANCE
OLD MILL TEA GARDEN, NEAR TORONTO
A. H. CHAPMAN, ARCHITECT
W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS
ARTHUR M. KRUSE, ASSOCIATE

THE ROSE GARDEN, "RAYMAR," OAKVILLE, ONT.

Professional Practice in Landscape Architecture

Apropos to the foregoing article, the official statement of professional practice issued by the American Society of Landscape Architects forms a subject of related interest in that it deals with the qualifications and capacity of the landscape architect and the code of practice which should govern his professional conduct. The statement in question was adopted in September, 1919 and revised in March of this year, and reads as follows:

A landscape architect in good professional standing has artistic ability and thorough technical training to deal with the problems which he undertakes. His remuneration is an openly stated compensation received directly from his client for services rendered, and not a hidden or speculative profit on materials supplied or labor employed.

To the extent agreed upon with his client, he gives oral and written advice, prepares or directs surveys, develops general designs, working drawings (such as general construction plans, grading and drainage plans, planting plans, and incidental architectural and engineering details), and specifications; supervises the execution of his plans; and co-operates with experts in other fields, including architecture, civil and sanitary engineering, and forestry. He should be consulted as soon as the proposed development is under consideration.

He acts, to a reasonable extent and as authorized, as his client's agent in selecting and ordering materials and in issuing instructions for the execution of work by contractors or others; and he acts in a judicial capacity with respect to the relations between his client and material-men, contractors, or labourers, with whom on his advice the client has entered into business relations.

In accepting employment he undertakes an obligation to protect his client's legitimate interests to the best of his ability in the matters confided to him. He is not pecuniarily responsible for the quality or quantity of the results obtained under his direction, especially for the failure of plants to grow or to be delivered promptly. His right to compensation for services, rendered in good faith and with due diligence in accordance with a proper authorization, is not dependent upon his

ENTRANCE FROM HIGHWAY, "RAYMAR," OAKVILLE, ONT.

client's satisfaction with these services.

The benefits derived from the services of a competent landscape architect are normally a more perfect utilization of ground space resulting in a greater convenience of use and a higher degree of beauty, the saving of much trouble and annoyance to the owner, and often an actual saving in cost, both of development and of subsequent maintenance.

Methods of Practice

A visit to the grounds and a consultation is ordinarily the first step, to become thoroughly familiar with the client's wishes and with the nature of the problem. This visit binds neither party to any further dealings. Sometimes verbal instructions on the ground, in the course of a visit, with or without a written report or sketches, will meet the needs of the client.

The usual procedure if further services are desired from the landscape architect, is as follows:

(a) The making of surveys either by the landscape architect or in accordance with his instructions.

(b) The making of preliminary studies as a basis for discussion of the problem with the client.

(c) The preparation of a general plan based on the revised preliminary studies (a written report frequently accompanying this general plan to explain further any intent of the design that might not be clearly illustrated by the plan itself).

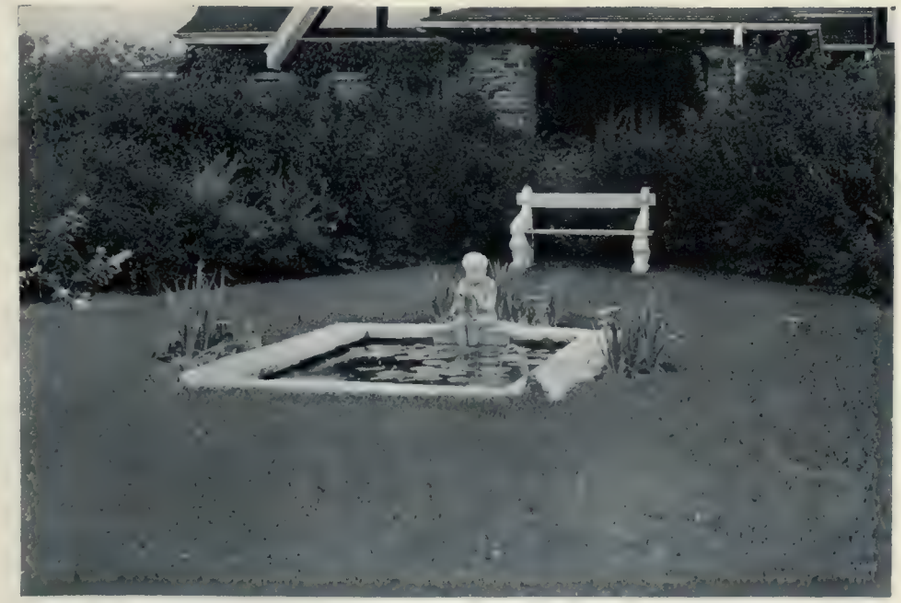
(d) The development of working drawings (with specifications), such as grading and drainage plans, large scale construction plans, detailed planting plans, and garden details.

(e) The obtaining of bids, and negotiations with contractors preceding the letting of contracts; or, in the case of day labour, the making of the necessary arrangements for executing the work; and the selection and ordering of plants.

(f) The general direction and supervision of the work by the landscape architect or his assistants during its execution.

The employment of a landscape architect conveys no authority to him to proceed beyond those stages of the work clearly covered by the terms of his employment; and the client has a right to terminate his services at any time on payment for services rendered and expenses properly incurred to date, unless there is a definite contract to the contrary. The plans and specifications prepared by a landscape architect are "instruments of service," and remain his property unless by special agreement in exceptional cases. Because of the extraordinary difficulty of securing satisfactory results in the execution of landscape plans without their designer's supervision to aid in their interpretation, it is contrary to the best practice for landscape architects to furnish plans for execution by others, divorced from supervision by themselves.

VIEW FROM DRIVEWAY



THE POOL, "RAYMAR," OAKVILLE, ONT.

MUNRO AND MEADE, ARCHITECTS
W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS
ARTHUR M. KRUSE, ASSOCIATE

In cases where growing plants are essential elements in the design the work of the landscape architect normally requires several years for its successful development, and the quality of the result is largely dependent on the skill with which the maintenance is supervised during this period. It is therefore important, especially in the larger problems, that he be retained in an advisory capacity for a period of one or more years after the completion of the initial work.

Methods of Professional Charge

The value of the landscape architect's services and the amount of his charges vary with the experience and reputation of the practitioner and also with the character of the work upon which he is employed.

The American Society of Landscape Architects approves the following methods of charge as adapted to different types of work, and to the wishes of different clients:

(a) A fixed sum for stated service.

1. A lump sum fee, including all expenses.
2. A fee plus expenses.

(b) Per diem charges for the time of the landscape architect and of his assistants for visits and consultations or for supervision of work.

(c) A per acre charge, covering total professional services, for development of large country estates, real estate subdivisions, parks and institutional properties, but excluding smaller suburban home grounds and gardens.

(d) A percentage charge on the "total cost"* of the work executed, and varying with the amount of work to be executed within a definite period.

(e) An annual retaining fee or salary for professional services rendered to municipal and other corporations; and in general for the continuing advisory services which are often essential to the wise maintenance and gradual development of landscape work following its initial execution.

In any of the foregoing methods except "a lump sum fee" expenses are usually rendered as additional charges. Such chargeable expenses may be defined by individual agreements. They normally include some or all of the following items; travelling and living expenses of the landscape architect and of his assistants while away from the office; long distance telephone calls, telegrams, express charges, prints and photographs; fees for services of specialists when required and authorized by the client; other special disbursements authorized by the client; and under methods (a), (c) and (e) a charge for time of assistants while engaged on work authorized by the client. When the work of more than one client is visited on any one trip, travelling and living expenses are proportioned among the works visited.

In case of the abandonment or suspension of the work, payment is due the landscape architect in proportion to the services performed.

Payments to the landscape architect are due according to bills rendered either at monthly intervals or at stages of the work when it is practicable to determine charges for profesional services and expenses to date at the work progresses.

*The "total cost" of the work is to be interpreted as the cost of all labor and materials necessary to complete the work, plus all transportation charges, plus contractors' profits and expenses, as such cost would be if all materials were purchased new and all labor fully paid for at market prices current when these were ordered.

Waste in the Building Industry

Summary of Report of Committee of the American Engineering Council, appointed to Investigate Wasteful and Uneconomic Conditions in the Building Industry.

HALF a billion dollars a year in wages is being lost in the building industry through unemployment, it is asserted in a report made public by the Committee on Elimination of Waste in Industry of the American Engineering Council, appointed by Herbert Hoover. Lack of work is declared to be the outstanding fact in this industry, whose critical condition following the war is attributed primarily to the high costs of construction.

Waste, it is said, is causing huge losses in building which, including all trades and common labour incidental to it, ranks second among the industries and contributes to the wealth of the nation more than $3,000,000,000 yearly. Yearly averages for the past six years show that 32 per cent. of the activities of the industry, which employ some 3,000,000 mechanics and laborers in a single year, are devoted to residential buildings, "Miscellaneous" covering the rest.

Chief Sources of Waste

The chief sources of waste in the building industry are, according to the report, irregular employment, inefficient management, and wasteful labor regulations. Customs or conditions prevailing throughout the industry, and poorly designed equipment are given as secondary causes.

The annual economic loss due to accidents is estimated as high as $120,000,000. Application of safety methods, it is stated, would save to the industry 12,000,000 days a year.

Loss through duplication of estimates and designs, and duplication in bidding, is said to run into the millions. An acute national shortage of housing exists, the committee says, with costs prohibitive to householder and banker. Improvement in production is noted as a result in part, of weeding out "war's misfits." Many union rules are condemned as "absolutely wrong." Both employers and employees are blamed for restriction of output.

The committee's investigation covered the entire country, special attention, the report says, being paid to representative cities such as New York, Boston,

Philadelphia, Baltimore, Chicago, Cleveland, Atlanta and San Francisco.

The inquiry into the building industry was made as a part of a national assay of waste conducted by the committee, of which J. Parke Channing of New York is chairman and L. W. Wallace of Washington vice-chairman. This assay originated with Herbert Hoover, who recently retired from presidency of the American Engineering Council and embraced six leading industries. The building investigation was in charge of Sanford E. Thompson of Boston, who directed a large force of field workers.

Building Workman Busy Two-Thirds of His Time

"The building trade workman," asserts the report, "is busy on the average about 190 days in the year, or two-thirds of his time. A few contractors, individually or associated, are attacking this problem with effective results. The public also must be educated to the need of sensible distribution through the year of its construction demands and requirements. Idleness, however, is due entirely to seasonal demands; strikes and lockouts are appreciable causes.

"Haphazard management in planning and controlling work and lack of standards, which often double the labour cost, characterize most construction undertakings. Here, again, a few builders, recognizing the waste in money and man power, are adopting methods that approach modern factory management.

"Union regulations in the past have produced enormous losses through direct or indirect restriction of output. Workmen and contractors, however, are beginning to appreciate that reduced output reacts in tremendous fashion upon themselves.

"In some construction trades, accidents involve losses up to ten per cent. of the labour cost in addition to the human loss of lives and energy. The average loss, computed from insurance statistics, is about two and one-half per cent. of labour cost. Here also certain contractors have found it possible to cut their accidents in half through special efforts.

Greater Co-operation is Essential

"Greater co-operation between the workmen and the employers is an absolute essential. This co-operation must be attained before we can approach the elimination of labour difficulties. Such co-operation, however, is impossible without the removal of causes of friction and the working out of plans to that end.

"A striking fact about the building industry is that inasmuch as small buildings require so little capital or credit, and apparently so little technical ability, the field is full of small contractors, many of whom operate for a few years and then fail. In Cleveland, O., for example, out of 4,000 contractors perhaps not more than 400 are needed. From these small firms the range runs up to the highly capitalized company with yearly business in the millions, employing thousands of workers and having a trained technical organization."

To total shortage of housing in 1921, it is found, amounts to 53 per cent. of the total square footage (called the real measure of value) constructed in 1915. "To this percentage must be added," the report continues, "if we consider the footage constructed in 1915 as equal to the requirements of that year, seven and one-half per cent. which represents the increment required to cover the increase in population.

"The need for building is most evident. The costs are so high, however, that the householder cannot afford to buy, nor can the banker loan money because of the danger of loss through the inevitable fall of prices.

The Reason for Tight Money

"The high cost of labour and materials in 1920 and 1921 prohibited bankers from loaning money on ordinary building and dwelling house construction. They reasoned, and correctly, that the price of materials and labour would drop so that buildings erected at a later date would cost less, thus causing a fall in the selling prices. Added to this have been the income tax conditions, so that the funds which were at one time available for mortgages have been forced into tax-exempt securities. Notwithstanding, therefore, the shortage of housing and the need for new construction, the actual work going on has fallen to a remarkably small figure and this in turn has been reflected in unemployment. In certain cases advantage has been taken of the conditions.

"Much has been said in 1921 of the inefficiency of building labour during the last few years. However, except where effective management with well-defined standards have been in operation, there have been similar complaints throughout the country in all industries. This inefficiency has been due to the abnormal conditions.

"The war necessitated calling into the ranks of skilled workers and into the foreman class men unfitted by character or training for their jobs. The demand continued to exceed the supply, resulting in bidding for men and boosting of wages.

"Because of the unprecedented demand, organized labour forced concessions not only as regards increases in wages, which were usually justified by the increased cost of living, but also as regards working rules which led in many cases to curtailment of production. The speed needed on government work to win the war, with the lessened care for cost engendered by the cost-plus contract, resulted in less effective operation. The men naturally became accustomed to this inefficient method of working and it furnished in one sense a standard for future efforts.

"With the depression in business and the lessened demand for all kinds of labour, the average production in all industries is again approaching normal. Certain contractors are again basing estimates on the assumption that labour is normally efficient. The improvement is in part due to the weeding out of misfits in both labour and management."

Waste Through Irregular Employment

Analyzing the causes of building waste, the report says irregular employment is due to seasonal fluc-

tuations, bad weather, strikes and lockouts:

Inefficient management is blamed on failure to furnish continuity of employment; failure to plan work in sufficient detail; lack of proper schedules to allow proper co-ordination of scheduling, purchasing delivery, with job requirements; lack of standard and adequate cost methods as a means of checking production; high labour turnover; failure to use proper amount or type of equipment; general failure to develope and use a greater amount of mechanical equipment; and waste of material through careless handling and improper plant operations.

Wasteful labour regulations, according to the report, consist of requiring skilled men to do work that could be performed by unskilled, restricting individual incentive through requiring uniform wages, limiting the number of apprentices, excessive reduction of working hours, restricting output by prohibiting the use of labour saving devices, and jurisdictional regulations.

Additional sources of waste are failure of architects to furnish check plans and specifications, duplication of labour in estimating and often in design, and accidents which are particularly important in the building industry because of the extra-hazardous nature of the work.

Large Fluctuations in Volume of Business

Large fluctuations in the number of men employed by representative contractors, indicating also the great fluctuations in the volume of business carried on, are reported. Assuming that the figures for unemployment due to all the causes in the building trades in Massachusetts are representative of the entire country, and if one-half of this unemployment could have been eliminated, the value to the building industry or its wealth to the country would have been increased as follows: 1915, $106,000,000; 1916, $91,000,000; 1917, $113,000,000; 1918, $85,000,000; 1919, $141,000,000; 1920, $192,000,000.

Representative average conditions in the building trades of Philadelphia and vicinity reveal lost or wasted time as high as 44 per cent. among iron workers, 37 per cent. among roofers and 29 per cent. among steam fitters, plasterers helpers and stone cutters, 40 per cent. among roofers and 29 per cent. among painters and paper hangers. This percentage is based on the relation of the average days worked per year to the number of effective days possible.

The days at work average 189 per year for the various trades in Philadelphia. The average of estimates reported by contractors is 210 working days a year. Over half of the lost time, it is estimated, is due to bad weather and the balance chiefly in waiting for or looking for work.

Turnover Losses

An extreme example of labor turnover in Philadelphia is the case of a man who in the course of five and one-half years worked for 76 different contractors and was hired 108 times. The report says the enormous turnover causes losses to both employers and men, adding:

"Contractors have given the effect of labor turnover little consideration. In construction work this is particularly hard to determine, especially as the actual percentage of turnover constantly varies as the building progresses and the number of men is increased and then diminished. Men quit because of the type of work they are to perform, risk involved, unfair treatment by foreman, and so on. They are discharged because of lack of work, incompetence, laziness, causing trouble, or because better men are available.

"Although efforts toward reducing seasonal unemployment have been local and often spasmodical, recent developments and conferences have shown the possibilities of vast improvement. The means of bringing about a reduction of seasonal unemployment may be outlined as follows:

"Allowance of a small margin of profit for both labour and capital during winter months, development of methods of conducting the work in cold weather, arrangement of work to provide indoor operations in cold and stormy weather, organization of a clearing house for co-ordination of activities, increasing the usefulness of employment bureaus, and educating the public.

All-Year-Round Operations

"Contractors must prove to the public that they can carry on operations during the winter period as economically and substantially as during other periods of the year. To do this, contractors, labour, transportation, and material men in a locality must all get together and, after joint study of the situation, agree to reduce profits and wages an amount that will offset the increased cost of carrying on work in winter months.

"The education of the public is vital to a sensible distribution of work throughout the year. This applies equally to industrial, public, and residential construction and to household repairs and maintenance. Instead of crowding our main construction work into seven or eight months, all that can be deferred from the busy to the more idle season should be scheduled. Owners making interior repairs or slight additions should be encouraged to have this work done in the off-peak season. Old buildings to be demolished to make room for new ones should be torn down in cold weather in advance of the new construction instead of waiting, as it is often done, until the new building ought to be under way.

"Real estate dealers lease apartments usually in October and do all the redecorating work and repairing at this time. An architect in New York City has stated that some 25,000 painters and paperhangers are needed during this brief period, while normally only 5,000 men are required.

"With a central bureau, under the auspices of the employers, the workmen, and the public, these and many other things would be studied with effective results."

The Strike is an Economic Waste

The strike is one of the greatest economic wastes to be found in the building industry, the report de-

clares. "The waste to the men engaged, the contractor, and the public is hard to estimate. The major causes of strikes are occasioned by demand for increase in wages, recognition of the union, decrease in working hours, and by jurisdictional disputes.

"Incidental to these causes and often aggravating them are the working conditions, while in almost every case the prime factor is the lack of understanding and failure of the employers and the workers to get together.

"The number of strikes and lockouts occurring in the building trades increased from 302 in 1914 to 452 in 1919, an increase of 50 per cent. This increase is accounted for in part by the great demant for labour in 1919, which inevitably makes the requirements of workmen more exacting and arbitrary. Of the 1919 figure, 452, only 18 or four per cent. are listed as lockouts, so that the waste due to lock-out is relatively small."

If the Massachusetts rate of 138,519 working days lost in 1920 is applied to the entire industry a waste of some 3,000,000 days per year is found. The report continues:

"If the greatest cause, the demand for an increase in wages, could be eliminated, strikes as a factor of waste would shrink into insignificance. The remedy that suggests itself is co-operation. Management and labour must forget the sore spots of past conflicts and through whole-hearted co-operation fix by proper studies a minimum wage to correspond with a standard amount of production, with additional compensation for additional output. This would furnish an incentive to men and would give recognition to deserving mechanics.

Elimination of the Flat Rate

"Unions must co-operate to the extent of eliminating the flat rate for all mechanics of a trade, and to the extent of modifying the restriction that forbids mechanics to accept piece work. With definite standards fixed and with the co-operation of both parties fair incentives can be introduced.

"The most encouraging sign in the elimination of the above causes is found in what is known as the 'Philadelphia Plan' put forth by the labour element of that city."

This contemplates the organization into a single body through associations, groups or committees, of each employing branch of the building industry in number at least equal to the nineteen represented in the Council of the Associated Building Trades. A heading-up committee, composed of an equal number of representatives from the groups of employer and employed would constitute the tribunal or council of the building industry in Philadelphia. The plan purposes the establishment of a central bureau through which voluntarily all construction programs in the territory should be cleared including national, state, municipal, and private work.

The old methods still exist in many quarters but are passing, the report says, adding:

"They must not be replaced by a 'go-easy' policy which takes all the stamina and character and individuality out of a man, but by well defined methods, such as definite records of accomplishment, scales of wages based upon quality and quantity of work done, or bonuses for coming within the required standards of quality and production. All of these devices, however, are worthless without determination of standards, knowledge of a proper day's work and control of the work and materials as above described."

Not Enough Mechanical Equipment

General failure of the building industry as a whole to develope and use a greater amount of mechanical equipment is an established fact, the report says. Greater strides have been made in almost every other industry in the application of mechanical means, it is said. Union objection to labour-saving devices is wrong in principal, it is declared, and will be relegated to the past like the restriction of output.

"With thorough co-operation of unions with employers and the development of the old guild spirit, which tends to give a man pride in the quantity and quality of his work, there is the possibility of increasing production and, by these means, of maintaining high wages yet with a resultant lowering of costs." says the report. "Lower labour costs mean more building and more continuous employment for the worker.

"Many union rules are absolutely wrong and uneconomical. Many unions have exceeded the limits of fairness, and partly because of the leaders' lack of appreciation of the fundamental need for high production, have formulated by-laws, and, in individual cases, have formulated demands that have been a tremendous factor, directly or indirectly, in the restriction of output. This has resulted in increase in cost and reduction in the demand for building. It represents, in fact one of the great sources of waste in the building industry. This policy has reacted, resulting in widespread opposition to unions. In fact, some of the most successful building contractors employ non-union labor because of their opposition to unjust union rules and requirements.

"It must be recognized that the unions are by no means alone in their restriction of output. The contractors and builders and supply dealers affect the situation to as great a degree indirectly by maintainance of high prices, collusion in bidding, and unfair practices. Collusion between unions and employers also has raised prices unduly.

No Incentive for Large Output

"One of the greatest fundamental causes for low output is the fact that all members of unions in the same trade are paid the same wage. There is no incentive. As a result of records made by the authors on actual construction work, it was found that in the building trades on every job there are usually a few men who do one-third more work than the average man on this same job. These men also do better work. Is it fair to these good men for them to receive the same wage as the others?

"Restriction of apprentices in many cases is extreme and unfair. Overtime and travel rules, also tend to increase building costs unduly.

"Many unions at the present time have in their

by-laws no requirements for restricting output, contrary to good principals. A potent source of labour waste is the jurisdictional practice which distributes certain types of work to different trades, frequently without regard to expense."

Despite the restrictive action of many of the union regulations, says the report, there is growing evidence of willingness to co-operate. Philadelphia and San Francisco are cited as cities in which co-operation is evidences. In Cleveland co-operation in tile setting, it is said was hindered by employers. Co-operation in the needle trade of Montreal is pointed to as an example for the building industry.

One of the principal aims of the trade unions, the report states, should be to make their services valuable to the employer by developing and training the men in their organization and establishing a high standard by assisting in the development of standardization of time, method and material.

Losses Through Accidents

Enormous losses are suffered through accidents, the $30,000,000 paid yearly to insurance companies for compensation and liability insurance by no means representing the total lost, according to the report which adds:

"In the opinion of one of the best authorities in the country the actual cost on insurance represents not more than 25 per cent. of the total economic loss, which brings the total cost due to accidents in the vicinity of $120,000,000 per year, a staggering total."

In Massachusetts during one year accidents caused a loss of time of 485,486 days. In New York State, where four times as many workers are employed in the factories as are employed in building and construction work, there are more fatalities due to accidents in building than in factories during a four year period.

Accidents, it is stated, are largely caused by carelessness of the workmen, or lack of ordinary safeguards. Conditions which would not be tolerated in a factory for 24 hours are found on every job, it is asserted.

Great savings are possible, says the report. "An official of a large insurance company believes that by proper safety measures the waste due to accidents can be reduced to 75 per cent. in from two to five years of honest effort, and that construction labour cost can be cut three per cent. by these measures. Another official estimates, from actual accomplishment in safety measures, that a total of more than 12,000,000 days a year could be saved the industry by the application of safety methods."

Delays Caused by Architects

Architects, the report says, frequently cause expensive delays and occasionally complete shutdowns by failure to deliver detail plans at the proper time. The waste of time and energy and money through duplication of estimates and of designs, it is declared, runs into millions every year. An equal, if not greater, source of waste is said to be the duplication in figuring quantity by all bidders.

The report, which states that both government and state records were found sadly at fault in quantity, kind, and accuracy of data, concludes.

"The most encouraging feature in the building industry to-day is the action of a few of the builders and a few groups of building trade workmen in making intensive studies of the causes and remedies for irregular employment and haphazard conditions of work. Along with this is the growing appreciation on the part of both labour and management that to build more buildings and maintain high wages it is necessary to attain greater and greater productive capacity per man.

"They see as proof of these facts that the 1921 depression was caused and extended by too high costs of all products, and that business, either in manufacturing or in building industries, is improving only as the costs of material and the cost of labour are reducing. All are recognizing, in fact, that no progress can be made with paying greater and greater attention to the elimination of waste.

"Never in the history of the country was it so important that certain fundamental principals of economics—principals which are not mere theories, but are based positively on facts—should be accepted and established as a working program. These principles will throw overboard the fallacy that restricting production can make work go further, and will supplant this with the knowledge to get one must give, that to receive the equivalent must be given in money or in time or in effort, and that increased returns can only be attained through increased production."

Testing Canadian Woods

The announcement has recently been made that the Board of Works for the United Kingdom has added certain Canadian timbers to the list of those used by the department. That the qualities of Canadian woods might be understood and the timbers thereby put to the best possible use was the object of the Minister of the Interior, Canada, in establishing the Forest Products Laboratories in connection with the Forestry Branch. The laboratories are making mechanical and physical tests of Canadian woods and the results are published from time to time as the investigation of each species or group is connected. The information obtained is proving of great value not only to timber users in Great Britain and other countries, but also to Canadian engineers, architects and builders. Beginning with the more important species, the investigation is to proceed until all woods having any commercial value are tested. Bulletins 59 and 60, the two so far issued on this subject, may be had free upon application to the Director of Forestry, Ottawa.

"KAWANDAG" SUMMER HOME OF SIR JOHN C. EATON, ON LAKE ROSSEAU

WICKSON AND GREGG, ARCHITECTS

W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS

ARTHUR M. KRUSE, ASSOCIATE

LAKE ELEVATION OF RESIDENCE

"Kawandag"

Summer Home of Sir John C. Eaton, on Lake Rosseau

ONE of the most interesting types of Canadian landscape development, and a type which is coming more and more into the foreground in Canadian practice is that of the summer residence in the lake regions and vacation grounds of Ontario. These differ from the suburban estate in that the development is in every way a seasonable one; winter effects and the materials used to produce them are not features in the treatment. The vacation region of Ontario is located along the rocky lake shores of the northerly districts, and the attraction to the client is usually that of the wild and informal, as against the formal and restricted city home. The treatment of such places is to a large degree one of re-establishing the natural conditions which have too often been destroyed, either by fire or through human agencies, and to provide easy and attractive access to the particular points of interest which may exist, and give additional points of interest where there is monotony.

One of the best examples of such development is that of "Kawandag," the summer home of Sir John C. Eaton, at Rosseau, Muskoka Lakes. The site for the house was selected on an elevation at a point of land from which, on the one hand, a splendid view down the lake was obtained, and on the other, a view across the bay to the town. The property abounded in stone out-croppings peculiar to the Muskoka region and was generally well-wooded. It was unfortunate in this particular case that a large portion of the grounds, including the woodland, had for some years been pastured, and a great many of the native shrubs and flowers had in this way been lost. It was therefore chiefly by means of collecting from the surrounding region that many of the natural effects were replaced. One of the greatest difficulties in this particular development, and one which is more or less common to the district, was the lack of good soil required for lawn purposes, and the difficulties of drainage due to the deep pockets in the underlying rocks, causing bog conditions, on the one hand, and lack of water caused by the shallow depth of soil covering the large areas of rock, on the other. Owing to these difficulties, a large area of greensward is a distinct feature. It was possible to obtain soil in sufficient

LAKE AND LIGHTHOUSE VISTAS FROM LAWN

quantities to provide for this along the entrance and around the residence, while other open areas were allowed to remain in their wild state. Vistas to particular objects such as the lighthouse, the boathouse, and the bathing beach were secured by judicious cutting.

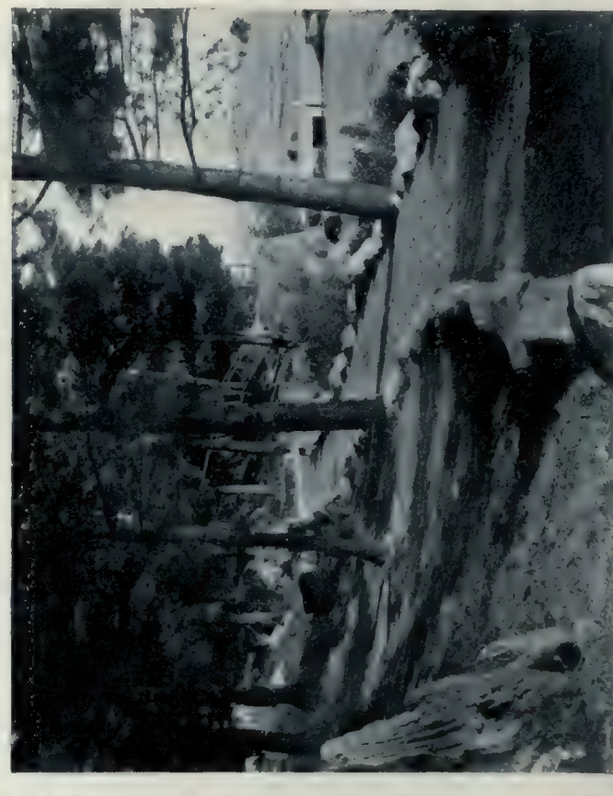
In the layout of the grounds, regularity in design was confined to the small rose garden and kitchen garden area adjoining the south east wing of the house. All other developments were made along lines of the drives and trails leading to and through the wooded areas. In laying out these trails it was the purpose to provide that guests of the residence could, if they wished, take fairly long and varied walks through a variety of natural conditions, passing interesting features, such as vistas, wild flower plantings, etc. The walks in the vicinity of the residence were generally treated with hardy flowering shrubs foreign to the district, which gave more in the way of color, when in bloom, than is obtained from the native varieties, and to these were added the more showy of the perennials. As the walks ran toward the woodland, the materials used were, in as far as possible, selected from the wild varieties, both of shrubs and the woodland flowers.

Of the informal features developed on the property, the rock garden and also the aquatic plantings might be mentioned. The natural geological conditions made feasible the establishment of a rock garden. A natural declevity in the ground surface allowed for the planting of rock loving flowers on the inclines, and the retention of a pool in a water pocket at the bottom, where semi-aquatic plants were established at the water edge. In two locations on the water front of Lake Rosseau, one near the main boat landing, and the other near the bath shelter and bridge, aquatic plants such as hardy water lilies, etc., were established in these areas. To maintain still water and prevent the wash from the waves of the lake, open rock breakwaters were constructed.

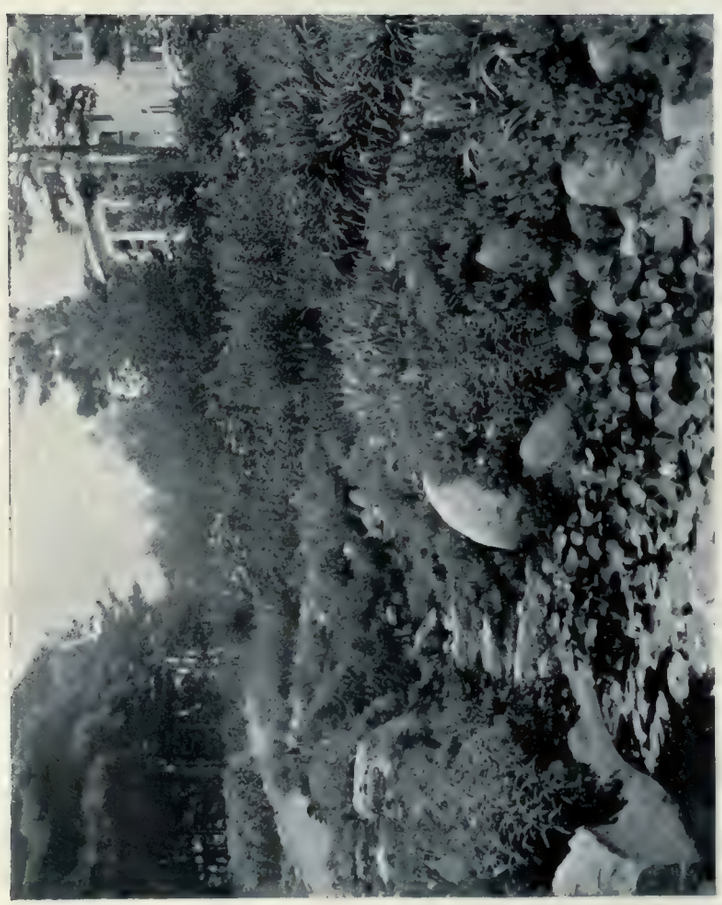
The accompanying illustrations show some of the effects of the natural or informal treatments at a period of four or five years after completion.

Such effects are not to be credited solely to the landscape architect in an estate of this nature,for the ultimate beauty can only be secured by the intelligent and constant care of someone who particularly appreciates the beauty of natural effects.

THE ROCK GARDEN



BATH SHELTER AND LILY POOL



THE BRIDGE AND LILY POOL

THE LAKE TRAIL

WICKSON AND GREGG ARCHITECTS

"KAWANDAG," SUMMER HOME OF SIR JOHN C. EATON, ON LAKE ROSSEAU

W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS

ARTHUR M. KRUSE, ASSOCIATE

Codification of Sanitary Laws Advocated

In advocating for a codification of sanitary by-laws, Mr. John Wright, of Toronto, in a recent address before the Canadian Society of Domestic and Sanitary Heating Engineers, declared that if attention was drawn to the general conditions prevailing throughout Canada as a whole, a fact which would present itself is that no generally recognized standard as yet exists regarding sanitary plumbing and ventilation. There are, he states, a multiplicity of laws and by-laws adopted by various cities and towns throughout the country and enforced more or less according to their own interpretation. While in some places approved principles are fully recognized, they are not always enforced, while in other cases no cognizance is taken of existing regulations, so that even sanitary plumbing is installed in such a manner that it becomes a menace instead of a safeguard to public health.

"KAWANDAG"— A WOODLAND TRAIL

"Our larger cities, realizing the importance of the proper installation of sanitary plumbing, have endeavored to so amend their by-laws as to meet these conditions by examining and licensing the men engaged in this occupation, with such good results that others are falling into line, as it is an essential point in placing sanitary plumbing on a properly recognized basis in its relation to health. We are, however, confronted with the fact that from coast to coast there are many varieties of sanitary plumbing, some of which testify to the forethought and intelligence of our Boards of Health and Municipal Councils, whilst others are a positive disgrace to the name of sanitation, and some of the abuses call for serious consideration.

"We must bear in mind that smaller cities and towns are destined to become larger cities in the future, and therefore means should be taken to improve their sanitary conditions —and this calls for a universal standard. Mere amendments to old laws are seldom satisfactory, as in some cases they do not recognize any set principles but follow along the lines of what some other city or town has done, and which may or may not suit their local conditions. It becomes evident that we require a 'central authority, if a set standard is to be established, and therefore the federal government should legislate along these lines to prevent the useless experimenting and continual alteration of laws in these small centres, so that an efficient scientific standard of sanitary plumbing, heating and ventilation may be recognized and established throughout the length and breadth of the country."

Mr. Wright ascribes part of the present difficulty to the speculative builder who, owing to the competitive system prevailing and whose sole aim is the profit he hopes to make on a house when sold, disregards all standard efficiency, devoting his talents to securing an attractive outside appearance and in trying to bring the cost of erection down to minimum, neglects the health of its future occupants. If he cannot evade the law by using inferior materials, he will hire incompetent mechanics who, in turn, may sublet the work at such prices

(*Concluded on page 254*)

"KAWANDAG" —TRAILS AND PLANTINGS FROM THE LAKE APPROACH

O. A. A. Proceedings

Date Set for Joint Convention with R.A.I.C.

FOLLOWING the precedent of two years ago, a joint convention of the Architectural Institute of Canada and the Ontario Association of Architects will be held in Toronto on Monday and Tuesday, October 10 and 11, at the King Edward Hotel.

This was decided upon at a meeting of the Council of the O. A. A. held in the Association rooms at Toronto, on August 3, with President Moore in the chair and Messrs. Allaster, Hynes, Shepard, Watt, West and Wickson in attendance and after an exchange of correspondence by the Institute and O. A. A. with reference to fixing a time and place of meeting.

While it was tentatively understood that the R. A. I. C. assembly would be held in Winnipeg, a letter was received from President David R. Brown, of the Institute, stating that the Manitoba Association had requested that the convention in that city be postponed, and expressing the opinion that the architects of the western provinces would not be adverse to the meeting taking place in the east this year. In view of this development it was felt that Toronto would be the most suitable place, and that owing to its central locations the attendance would be larger than elsewhere.

Notices announcing the date have already been sent out by the secretary together with a special letter to the secretaries of the different chapters, and a committee with Mr. West as chairman, has been appointed to drum up interest in the convention so as to ensure a large attendance. The intention is to make the gathering one of the best meetings that has yet been held. The program, which is being arranged by Messrs, Hynes, Wickson, Cobb and Shepard, will be sent out early in September. An effort will be made to have the presidents of the Royal Society of Canada and the Royal Academy of Canada present to address the Convention in their scope of their activities. Other prominent speakers will also be invited and a large number of papers and important subjects will be presented for discussion.

It was suggested by Mr. Watt that two out of the three councillors should be from outside of Toronto; also that one member of the council should be elected to the R. A. I. C. In addition to the foregoing, the council gave consideration to a large amount of routine business, relating directly to the affairs of the O. A. A. including the following communications.

Letter from Mr. Bannigan, stating that he was not now practising architecture, and tendering his resignation, which was accepted with regret.

Letter from Mr. W. L. Somerville, regarding the submission of gratuitous sketches and questionable methods of competition.

Correspondence with Herbert Murton, Hamilton, regarding "Aylmer Hospital."

Letter from Gilbert Jacques, Windsor, embodying report on "School and Municipal Architectural Departments."

Letter from Mr. Gaby, chairman of the Hydro-Electric Power Commission of Ontario, suggesting the appointment of a representative from the Association on a Committee of Rules and Regulations on Institute Work. The president's action in appointing Mr. Walter N. Moorehouse in this connection was approved.

Letter from Toronto City Guild, re "Street Signs."

Letter from Hon. Secretary of R. A. I. C. re "Cairo Hospital."

Telegram, Col. C. P. Meredith, stating that the Ottawa Chapter has now been re-organized.

Court judgment in the suit of Brown vs. Noffke. (See CONSTRUCTION, June issue, page 189).

Letter from Mr. Ian MacAlister, secretary of the R. I. B. A., with regard to a competition for the Departmental and Courts Building, Ottawa, intimating that judgment had been handed down regarding which the council had no information. The secretary was instructed to send a copy of this letter to Mr. John D. Archibald, Architect, Montreal, to ask if he has any information to give on this subject.

Circular letter and by-laws from the American Specification Institute, Chicago, which the secretary was requested to acknowledge and to send list of members.

It was moved by Mr. Shepard, seconded by Mr. Allaster, that on the recommendation of the Ottawa chapter as per letter from Colonel Meredith, the application for membership of Mr. R. Gurney Orr be accepted.

The council also approved the application of Mr. D. J. Cameron for transfer from Associate to Member.

President Moore reported regarding the scholarship of $100.00 to be contributed for the best course in connection with the Department of Architecture at the University of Toronto. to consist of $33.00 from the Architectural Guild Prize Fund and $67.00 to be donated by the Association, stating that he had conferred with the other trustees and that they were favorable to the proposition.

It was voted that his sum be contributed to the Association for a period of five years, and that the president and Mr. Hynes be authorized to advise Dean Mitchell of the Faculty of Applied Science of the action taken.

The secretary was authorized to have the 200 membership list printed, at a cost not to exceed $10.00.

It was suggested by Mr. Watt that the attention of the members be called to the fact that the minutes of the Council meetings are regularly published in Construction.

It was moved by Mr. West, seconded by Mr. Allaster, that a letter be written to the R. A. I. C. as to chapter members in the Institute.

The attention of the Council was also drawn to a letterhead of a non-member of the Association purporting that he is an Associate of the O. A. A. and the R. A. I. C.; the secretary being instructed to write demanding that the use of same be discontinued immediately.

Notice was given by Mr. Hynes that he would move at the next meeting of the Council to amend the by-laws to prohibit any architect engaged on other business from remaining a member of the Association.

The treasurer submitted a preliminary statement regarding the finances of the Association for the year ending July 31 last, showing a bank balance of $1,179.43 and outstanding accounts amounting to $781.14.

Questionable Competitive Methods

The following letter sent by Mr. W. L. Somerville, to the Executive of the Ontario Association of Architects, refers to a matter recently brought to the attention of the members, and quite speaks for itself. Mr. Somerville does not restrict himself to generalities, but cites two specific instances of doubtful ethical procedure regarding the submission of sketches on the part of certain practitioners in an effort to secure new business:

Toronto, July 15th, 1921.

Herbert E. Moore, President,
Ontario Association of Architects,
Toronto, Ont.

Dear Sir:—

As a new member of the Association, I wish to draw the attention of the Council to a condition, which, according to my observations, is becoming worse instead of better, i.e., the submission of sketches in unregulated and informal competition, and voluntarily suggesting the submission of such sketches gratis, by members of this Association.

The recent circular letter sent out by the Association had all the "kick" taken out of it when it modified the ruling against such practice by stating possible exceptions, these being such that almost every condition could be covered by the use of a plausible excuse.

The violation of this rule by well-known members of the profession in good standing in the Association, (in some cases members holding office) makes it increasingly difficult for those establishing practice to convince the average layman that they are asking nothing more than that to which the are entitled, when charging for preliminary sketches. It also operates to prevent prospective clients from holding properly conducted competitions, and generally places the man who tries to live up to the obligations of his profession at a decided disadvantage.

I wish to mention two specific cases that I have recently been in touch with:—

(1) A hospital was considering the erection of an addition, and a question came up regarding possibility of seeking a new site. I was asked my opinion and I gave it to a member of the committee. Later on the secretary asked me to meet the committee and be prepared to show how it would be possible for them to use their present site and to give some idea of the probable cost of the additions contemplated. To show graphically what my scheme was, I made a plot plan, not showing the buildings in detail, but simply to illustrate my case. The report of the meeting was published in the newspapers, with the result that two local architects, one of who was a member of the Association, asked permission to submit a sketch for the proposed new buildings. The Committee gave their consent and asked me to do the same. I explained that I could not do this, and tried to show them how useless it was to ask an architect to submit sketches before they or the architect could possibly know what the actual requirements of the Hospital would be. I was naturally considered a "freak." None of the local men ever having heard of a "Survey of Requirements," I stuck to my plot plan and made no further sketches. The local architects submitted their sketches which none of the Committee as far as I could learn, considered possible. At this time a firm of well-known Toronto architects, one of whom is one of the Association's representatives, asked permission to submit sketches. Permission was granted and I understand the sketches have been submitted. What reason can I give that Committee for refusing to submit sketches?

(2) Another Hospital Committee asked me what my charges would be for preliminary sketches for a particular type of building that had been recommended, but which some of the Committee were rather doubtful of adopting. I explained the minimum fee for such services, but was later informed that a Toronto firm of architects, one of the members of which is also a member of one of the most important standing committees of the Association, had offered to submit sketches gratis. I understand that these sketches have been submitted.

I am mentioning these two cases as in both instances the firms submitting sketches involve prominent members of the profession. Please understand that I do this not through a motive of wishing to harm them in any way. I am quite willing to stick by my own code of ethics whether they do or not, but I do feel that in these trying times, some fellows in their anxiety to obtain new projects, are apt to not only permanently injure their own standing, but the standing of the profession in the Province and the Association in particular.

Yours very truly,

(Signed) W. L. SOMERVILLE.

The Orders in Modern Design

A RECENT article appearing in the "Builder," London, by G. Maxwell Aylwin, states in part that it is a phenomenon which the critics of the age must face that we find but few buildings of a monumental character in which the composition does not rely upon one of the classic orders as a basis, and that we feel the lack of something vital when an attempt is made to ignore them.

Beauty is, after all, the acid test of design, and the real justification for the use of the Classic orders to-day, he adds, continuing on this theme. Yet the mind is never quite content to accept the ruling of the eye, and an analysis of the beauty seen and felt is required to give confidence to the aesthetic eyesight and sensibility.

For our own peace of mind, let us consider whether revolution in construction has or has not rendered this practice false and inexpressive. It is a question that would never be raised had not science so far outstripped art, and to-day the architect must follow warily the headlong progress of scientific achievement.

Does, then, the wide span permitted by the modern lintel render the spacing of a Classic colonnade obsolete? Are the slender proportions of the modern structural column incapable of expression in Classic proportions? Has the Classic cornice any reason in a modern building?

Before attempting to consider such questions we must recognize that the orders have changes their usage from time to time. As developed to perfection by the Greeks, the column was actually a a structural support, the architrave a structural beam, the cornice carried an eaves gutter, and the pediment was a gable end. Faithfully designed, each member for its true purpose, such architecture is above suspicion or reproach. In the hands of the Roman and Renaissance architects, however, the orders lost much of their reality and are more difficult to defend. In most cases they were used as an applied decoration, structural only in an aesthetic sense in that a composition was built up upon the framework of an order or orders. Beauty of result must again drown the adverse criticisms of the purist.

To-day the orders have become a seemly garment for the bare structural members of a framed building in a trabeated system, and as such they have a far greater significance than ever before, since they were first evolved out of the limits of the same system in stone or marble. These limits have been swept aside, but we have no need to apply our architecture to a self-supporting and self-protecting stone wall. It has rather to be a protection against fire and weather and an embellishment to ugly and vulnerable materials.

At first thought it would seem that a colonade framed in steel or reinforced concrete should be expressed in a wider spacing than of Classic usage, yet the most cursory examination of a modern building during erection will show how very much more extravagant of material are lintels than are stanchions, so that the closely spaced colonade where conditions permit is quite consistent with modern methods. The problem of the shop-front is a thing apart, and it is significant that the Classic orders used in this connection are rarely effective, and an insistence on the post and lintel idea merely suggests the impossibility of such a span in stone. There appears to be developing a new method of expressing these voids by simply framing them in a wide stone architrave around the whole opening, and the eye becomes satisfied with such a treatment.

In the upper stories of a modern building, however, where display does not call for continuous plate glass, intermediate supports may be introduced and the Classic colonade becomes a possibility. Case round the stanchions with an adequate protecting coat of concrete, and beautify them with a final substantial casing of stone, and we arrive at a member of a much more substantial nature than the stanchion itself, and reasonably treated as a Classic column embracing two or three stories of the facade. The shelf of the cornice, though no longer an eaves gutter, is a very real protection to the dominant division of the building against all but driving rain, and needs little defence.

When, therefore, it becomes so natural to make use of the Classic orders, why should we grope madly for that elusive "new thing under the sun" for which men have vainly striven throughout the ages? The eye approves and the intellect can justify Classic proportions developed by the conditions of the past and applicable to those of the present. That in detail there should be some freedom is but natural and right. The fully carved and serrated Corinthian cap, for instance, is seldom seen in modern work, and is replaced by a type of cap showing sparing incisions and a formality of design suggesting its character rather than labouriously repeating its intricacies. The plain, dignified, Doric mutule often supplants the elaborately carved modillion, even in conjunction with a Corinthianesque column. Beyond such subordinate items, however, the general principles and proportions are those handed down to us from Greece and Rome through the Reanaissance, and the continuity is an added asset to modern style.

When purists realise that there is less to offend them in the modern colonnade than there was in the attached orders of Rome and the Reanaissance, we shall find more confidence and stability in the progress of architecture. There is far too much hypocrisy about such matters to-day, and many critics are merely depressing the younger school, which is doing its best to advance our art one step nearer its goal of perfection.

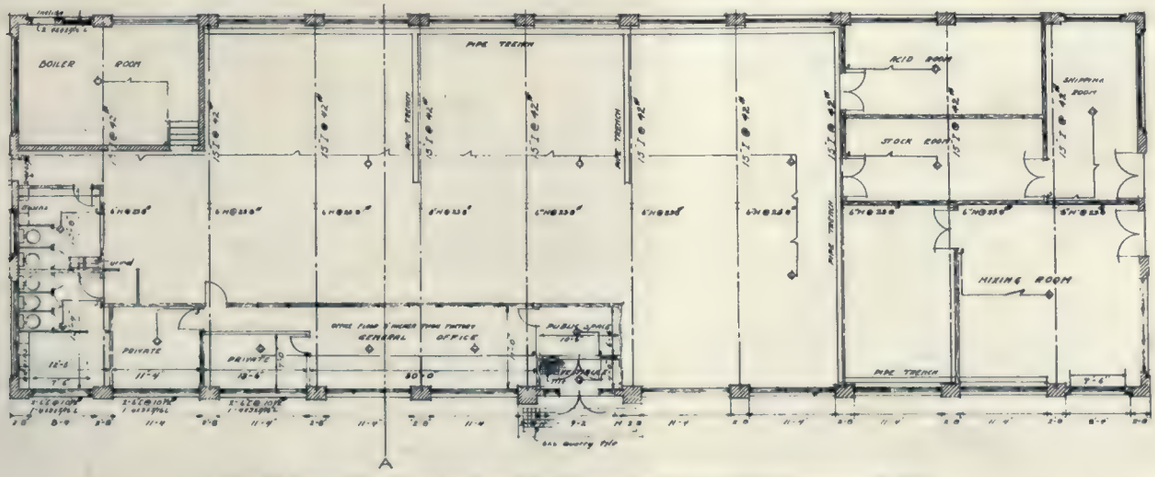
DETAIL OF ENTRANCE: PREMIER TIRE AND RUBBER COMPANY'S FACTORY, BEAMSVILLE, ONT.
FRYER AND EVANS, ARCHITECTS

Tire and Rubber Factory, Beamsville, Ontario

The first unit of an extensive plant for the Premier Tire and Rubber Company, Ltd., of Beamsville, Ontario, was completed last May, and is now in operation. The present building is of factory construction with outside walls of pressed brick, Indiana limestone trimming and steel sash. The photograph shows the detail of the entrance and two bays. Three additional bays extend on either side, the accompanying plan indicating the size of the existing unit.

It is the intention of the company to build a large plant when business conditions warrant. The present building will then be used as a general office, and with this in view the partitions in the factory were built so they could be removed with the least amount of labor.

The company also proposes when the occasion warrants to develop their own housing scheme along the lines of the existing garden villages; the entire scheme as contemplated providing for an extensive industrial development with attractive housing faculities for its staff.



PLAN OF PRESENT UNIT: PREMIER TIRE AND RUBBER COMPANY'S FACTORY BEAMSVILLE, ONT.

MEMORIAL TO THE FALLEN OFFICERS AND MEN OF THE 91ST REGIMENT, CANADIAN HIGHLANDERS, ERECTED AT THE ARMORIES, HAMILTON, ONT. FRYER AND EVANS, ARCHITECTS

Condemns Wooden Shingles as Fire Menace

In sixty years fires in Canada and the United States have destroyed property worth nearly fourteen hundred million dollars, and a large amount of this is chargeable to the wooden shingle, according to Fire Chief Teneyck, in an address delivered at the Fire Chiefs' Convention, recently held at Quebec City. Mr. Teneyck is of the opinion that both the federal and provincial governments should enact a law prohibiting the use of wooden coverings for roof covering. He moved a resolution to this effect, which was seconded by Chief C. E. Hart, of Westmount. Chief Jobin, of Quebec, opposed the motion, alleging that it was utopian to try to abolish the wooden shingle in small cities and villages in Quebec, where it was used for nearly all roof covering. Federal law to abolish the wooden shingle, he declared, would be too severe.

The motion was laid on the table after three hours' discussion. Mr. Lewis, Assistant Fire Marshall of Ontario, gave a lecture on the same subject.

Under New Name

The names of Batts Limited, Toronto, manufacturers of doors, staved columns and interior woodwork, has been changed to the Buyer's Door and Manufacturing Company, Limited. The business will continue under the management of Mr. John S. Bond, who has been associated with the firm for eighteen years, the Messrs. Batt having retired some three years ago. It is the intention of the firm to retain the established trade mark of "B.L." and to maintain the high quality of workmanship which have made the products of Batts Limited so well known.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER; LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO, - - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager

BRANCH OFFICES:
MONTREAL—171 St. James Street
C. S. Soutter, Representative.

WINNIPEG—336 Qu'Appelle Street
F. C. Pickwell, Representative

NEW YORK—505 Fifth Avenue
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements much reach the Head Office not later then the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.
Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, August, 1921 No. 8

R.A.I.C. and O.A.A. to Discuss Issues Jointly

Sizing things in the retrospect of the past two years, it must be said that the joint R. A. I. C. and O. A. A. meeting in Toronto in the Fall of 1919, and the well-attended convention of the latter body at London, last September, were instrumental, at least, in bringing about a healthy revival in association work.

Since then much effective organization and propaganda work has been done with corresponding results of benefit to the profession. This is evident in the increased membership, and the renewal of chapter activities particularly in Ontario. Again, the increase of duty which is now being levied on imported plans is due to direct representations made in the meantime to the Customs department. Something has also been achieved through publicity work to more fully acquaint the public as to what professional advice and competent architectural services really mean. Moreover, progress has been made in the matter of having proper conditions and qualified assessors adopted in the case of architectural competitions.

In view of this, the convention which is to be held in Toronto, on October 10-11, when the Institute and the Ontario Architects will again meet in joint session to discuss architectural matter, should prove of utmost importance. While the program has not as yet been announced, it is understood that a very complete agenda will be presented. It is to be hoped that the discussion will not be too confined to ethical and academic subjects, but that the convention will deal in part at least with some of the present vital factors having a bearing on the building situation as regards costs, and other related phases of the industry. A carefully prepared statement itemizing in a complete way the decreases to be noted in present prices as compared with the costs of material last year and setting forth the actual saving to be effected would undoubtedly be welcomed by the public.

The convention could also discuss the housing shortage, the question of loans, the present wages and availability of skilled labour, and the possible effect which these factors will have on the immediate future as regards building development. In a word there is still time to arrange for the presentation of a number of economic subjects of general public interest. The fact that the convention will take place in Toronto which is central to many points should insure a record attendance, and an effort should be made by every member of the profession to be present and to lend effective support to the good work which has already been accomplished.

Landscape Architecture

Why has the architectural profession made such rapid strides from its humble position of say a century ago? Because people have learned through seeing the results of employing architects that it is profitable to employ them. So it is becoming with landscape architecture as this field of endeavour comes more to be recognizes as a profession. In this issue, CONSTRUCTION presents a number of views illustrating recent developments of suburban and city properties, which indicates the satisfactory progress which is being made in this direction. The subjects show a variety of interesting landscape layouts and embellishments, and indicate a wholesome trend in domestic design and the development of desirable environments. In each case the result points to what can be achieved through the successful co-operation of the architectural and landscape professions, and the importance of their services to the owner in the solution of his problem.

Chinese Building

By George Cecil

THE Chinese builder differs so much from his Western brethren, that a description of the methods in vogue may interest those whose travels have not yet taken them as far afield as China. For the Celestial man of bricks and mortar is indeed an extrardinary person—so extraordinary, in fact, that he has no equal.

It is generally thought that the Chinese builders take a tent as their model, and that sameness of design is, in their eyes, a thing to be encouraged, for (with scarcely an exception) every house is alike. The towns in China have neither domes nor towers to vary the monotony of their buildings. The walls and the roofs, however, are coloured, according to the use for which the houses are intended: but for this, a collection of Chinese buildings would be singularly uninteresting. The curious upturned corners of the roofs are almost the only distinctive feature in the local architecture.

Historians declare that when the country first was invaded by the marauding tribes, who in the thirteenth century conquered the "heathen Chinee," they pulled down the walls of all the houses, leaving them supported only by the wooden pillars—a form of support which to this day bears the weight of the roof. So impressed were the architects and builders of the period by the appearance of these Tartar-like dwellings, that the innovation was unanimously adopted. And, curiously enough, the methods employed in the houses which have been built by European merchants and by the various Legations have not taught the Chinese a lesson. The houses in the Treaty settlements show the latest Western architecture; those which decorate the adjoining native quarter might have been constructed six hundred years ago.

It must, however, be admitted that John Chinaman allows his fancy to run riot when he is asked to build a pagoda, for he has the pillars fantastically carved to represent snakes and dragons, and he expends considerable pains upon the decoration of the roof, the double roof, by the way, being in particular request. Otherwise, the native architect is a curiously unimaginative creature—and an abnormally conservative one.

Flimsy

Nor do the Chinese build houses which are intended to survive stress of weather. They dig the shallowest of foundations; the materials of which they make use practically invite decay; and the bricks are so badly burnt that the thin walls often come down with the first gust of wind. But the jerry builders so far from incurring the wrath of his employer, thoroughly satisfies the patron. The last-named does not require a house which will last for all time; provided the wooden pillars which support the roof do not part company with the stone foundations on which they rest, the man who pays the bill is perfectly satisfied. A series of cross pieces connects the supports, the ends of which often are highly decorative. The pillars, which are cut in at the base, are quite plain, except in the case of a palace or some important public building. It should be remembered that, to prevent the posts parting company with their foundations, the roof has to be exceptionally heavy. It also must be completely finished before being placed in position.

As the nature of the support usually forbids more than one storey, every Chinese house has the same top-heavy appearance, while the dampness of the soil easily forces its way through the floors—which are of roughly pounded clay or ill-made bricks.

An Ever Open Door

Beyond the entrance is a courtyard, around which are the living rooms. At the further end of the courtyard is another one, a hall intervening. Then comes the garden, the whole being surrounded by a wall. In spite of its prison-like appearance, the house, or at least the front courtyard, is open to anyone who chooses to pass through the front door, which is never closed in the daytime. According to the extraordinary code of ethics ruling in this strange country, a Chinaman who keeps the door shut must necessarily be ashamed of what goes on within his house. The courtyard is used as a reception room, and the master of the house takes great pride in embellishing it by means of earthern vases and numerous examples of local pottery—in which are planted gaily coloured flowers. The above description applies to the home of a well-to-do person:—the Coolies live in mud huts.

The rich Chinaman has a passion for wood carving, and he often spends large sums in acquiring good specimens, with which to embellish the cornices of the rooms. The doors, too, are decorated in this manner, and if the wealthy Chinee has secured a particularly fine example of the carver's skill, he is the envy of his visitors. Tiles also are to his taste; and nothing delights him more than to have successfully vied with his neighbours in bidding for exceptionally gorgeous examples. For the rest, he hangs his walls with pictures by native artists and fills the rooms with native-made furniture of quaint design and workmanship.

The Mandarin's Collection

The very opulent Mandarin's house, or rather, collection of houses which is enclosed within the wall, usually has two stone figures of animals at the chief entrance. The gateway, which is exceptionally high, is hung with scrolls on which the dignitary" titles are displayed, and the first court is paved. There are three halls, each of which faces south, and from these branch off a number of rooms. Within the enclosure are several houses in which the Mandarin's retainers live. The garden is almost as large as the park of a European country house, and contains one or two temples, a lake and a hall

—in which guests are entertained. At the extreme end of the garden are stables, in which as many as forty steeds are to be found. The rooms in a residence such as the above are gorgeously furnished and decorated, and the sum spent on erecting the palace and its various annexes often is a huge one.

The houses all over the Chinese Empire do not differ much from those which have been described. Whether the builder is engaged upon a "Foo," as the palace is called, or merely in roughly putting together a tradesman's villa, he invariably uses the poorest materials.

Efforts Made to Reduce Freight Rates

Secretary George Gander, of the Builders' Exchange and Construction Industries, recently issued the following statement dealing with the activities of contractors to secure a reduction of freight rates:

"Notwithstanding the refusal of labor to cooperate with contractors for a reduction in building costs, the Exchange is carrying out the policy of reduction wherever possible, and a delegation is now in Montreal conferring with railway officials as to the possible reduction in freight rates which in many cases are costly and detrimental to the industry. A favorable reply is expected."

Mr. Gander stated that Mr. F. B. McFarren was placing the contractors' views before the Canadian Freight Association.

A Harbour Cut Out of Solid Rock.

There is a natural impression that all constructional engineering work of the ordinary kind in Great Britain was suspended during the war, but in point of fact it was found possible to keep quite a number of schemes going in spite of the concentration of effort upon definite war work. A case in point is supplied by an extensive harbour improvement which was begun in Great Britain a month or two before the war. The schmee included a new basin with an area of 2¼ acres and 1500 feet of new quays. All through the war the work proceeded steadily, if slowly, Its most remarkable feature was that the basin was cut out of solid rock to give an average depth of 13 feet. The material excavated was ingeniously used to reclaim from the sea a considerable tract close to the harbour.

Syndicate to Erect 150 Houses

A large tract of property fronting on Small Street and running east of Coxwell Avenue, has been acquired by a Toronto syndicate as a site for about 150 moderately priced homes. The land has a frontage of between 4,000 and 5,000 feet, and cost in the neighborhood of $125,000. It is understood that work is to be started without delay on about thirty houses, and that the remainder will be built as soon as these are disposed of. The houses will cost from $4,000 to $5,000 each, and are to be surrounded by sufficient land to make them desirable. The deal was put through by Robins, Ltd., selling for the Toronto City Estates.

Preventing Mortar Stains on Masonry

Brown stains on limestone masonry arising (presumably) from action of the mortar are being studied at the Bureau of Standards in Washington, where two methods of preventing this staining are under investigation. The first is the use of a colorless waterproofing material on the limestone at the contact face of the mortar, the action of which is to prevent the passage of water through the mortar and into the stone in such a way as to carry the staining material with it. Preliminary tests indicate that most of the staining is prevented by this means. A number of British architects specify a thin coating of pure lime putty to prevent contact of masonry laid up in cement mortar, with Portland stone. This is claimed to work well and has been in use many years. The second method consists of applying a removable porous coating on the exposed face of the limestone wall. The stains then come through the coating, form on its outer surface and later on are removed when the coating is removed, while when forming directly on the stone surface they are difficult to remove because the staining material is insoluble. The method is expected to be of some value, as most of the stains form during the erection of the masonry.

Contracts for Filtration Plant

Contracts amounting to $273,137 have been awarded by the Utilities Commission for the construction of a filtration plant in Peterboro. W. H. Yates Construction Co., of Hamilton, secured the award for the construction of the mechanical gravity sand filtration plant at their tender price of $198,378. This was the lowest tender received after the qualifying clauses and the other tenders had all been eliminated. The $65,800 tender of Ramsay & Wylde, of Sault Ste. Marie, for the construction of the large filtered water reservoir has been accepted, and that of the Escher Wyss Company, of Montreal, at $8,941, plus sales tax for the pumps. The tenders in each case were the lowest received.

The Utilities Commission will undertake the laying of the pipe lines. Forty-three tenders from Canadian firms and two from the United States were received.

Appointed City Architect

Mr. Franklin E. Belfry, for the past two years architect for Ottawa Housing Commission, and formerly in charge of architectural department of the Toronto School Board, has been appointed City Architect at Ottawa.

Codification of Sanitary Laws Advocated

(*Continued from page 245*)

that competent men know full well cannot secure desirable results. As thousands of homes are built each year, it is easy to see the condition which will result from such methods, providing necessary measures are not taken to secure legislation which will safeguard life and health.

Mr. Wright recommends necessary legislation should be passed by the Federal Government, requiring a compliance with a minimum standard of sanitation, leaving the different provinces and cities free to enlarge upon these laws by any special regulations, laws or by-laws they may consider necessary to meet their own climatic conditions and requirements.

To Place Memorial Tablets in All Branches

As a tribute to members of its staff who served in the Great War, The Canadian Bank of Commerce has unveiled a very handsome memorial tablet at its Parkdale Branch, Toronto. The tablet is a plaque of bronze and has a simple restrained design of olive branches intertwined with Flander poppies. Flanking the plaque is the Caduceus—the emblem of the bank— with wings folded in peace. About the upper circumference is engraved the legend: "In memory of 1,701 men of the Canadian Bank of Commerce who served in the Great War, 1914-1918." Below this are the names of two members who enlisted from this branch. It is the intention of the bank to place similar tablets in each of the branches where employees enlisted for overseas.

Obituary

Mr. Robert John Cooper, a well-known contractor of Toronto, passed away recently at his residence on Carlton street, that city. The deceased was a partner in the firm of Brown and Cooper for a period of over thirty years, and was a member of the Toronto Builders' Exchange since its inception.

Engineers' Craft Holds Convention

The nineteenth annual convention of the Universal craftsmen Council of Engineers was held during the past month at the King Edward Hotel, Toronto, with delegates from all parts of Canada and the United States in attendance. The organization is composed of civil, mechanical and electrical engineers with the membership restricted to Master Masons, and is fraternal, social and educational in character. A cordial welcome was extended to the delegates by Mayor Church at the opening session.

New 50 Bed Memorial Hospital

Work has been started by E. Webb & Son, general contractors, on a new fifty-bed memorial hospital at Orillia, Ont. The building will be two storeys high, 140x65 feet, of brick and stone construction, and will cost $110.000.

Bulletin No. 300

The catalog service of the C. A. Dunham, Ltd., has recently been added to by "Bulletin No. 300," which is published in French for the benefit of architects and others in the Province of Quebec and elsewhere, where this language is spoken. The Bulletin is illustrated, both with diagrams and halftones, showing the features of the well-known Dunham radiator traps for heating systems, and contains much information of practical value. A copy can be obtained from any of the company's branches in the principal Canadian cities, or on application to the head office at Toronto.

Change in Address

The Brantford Roofing Company, Ltd., have moved their Toronto office and warehouse to 259 King Street West, near the Royal Alexander Theatre.

J. P. Anglin, B.Sc., President — *H. J. Gross, Vice-Pres. & Treas.* — *C. D. Harrington, B.Sc. Vice-Pres. & Manager.*

ANGLIN-NORCROSS LIMITED

CONTRACTING ENGINEERS AND BUILDERS

MONTREAL TORONTO WINNIPEG

Solignum — Wood Preservative—Shingle Stain—supplied in special grades for interior woodwork. Made by Major & Co., Limited, Hull, England.

PARIPAN — The finest enamel for plaster or wood; flat or gloss, in colors. Made by Paripan Limited, London, England.

FLINTEX — Concrete hardener—makes floors frost, dust and wear-proof. Made by us here.

STURGEONS — French Polish Wax—the best wax on the market for all purposes. Made by us here.

STURGEONS LIMITED BRITISH PAINT SPECIALTIES 64-66 RICHMOND STREET E., TORONTO

Toronto, September, 1921 Vol. XIV., No. 9

CONTENTS

NEW MERCHANTS' BANK, TORONTO 257

A MEMORIAL GARDEN VILLAGE 260
By J. J. Bayliss

MOUNT PLEASANT MAUSOLEUM, TORONTO 263

TOWN PLANNING CONFERENCE, MONTREAL 270

FIRE TEST ON COLUMNS 271

STUDENTS' WORK, McGILL UNIVERSITY 272

ARCHITECTURAL EDUCATION 277

CANADA CEMENT BUILDING, MONTREAL 281

R.A.I.C. AND O.A.A. AGENDA 282

EDITORIAL 283

ONTARIO TOWN PLANNERS TO MEET IN TORONTO 283

THE USE OF ADVERTISING 284

FRONTISPIECE:

NEW MERCHANTS' BANK, TORONTO 256

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

EXTERIOR VIEW

NEW MERCHANTS' BANK, KING STREET WEST, TORONTO.

DARLING AND PEARSON, ARCHITECTS

NEW MERCHANTS' BANK, TORONTO

APART from being a building of noteworthy appearance, the new Merchants' Bank on King Street, Toronto, has an added interest in that it is one of four prominent bank buildings in the immediate vicinity, all of which in design represent the work of one firm of architects. The other buildings are the Dominion, Standard and Union banks dominating three of the four corners on the opposite side of King Street between Yonge and Bay, and which is still to be added to by the proposed new premises to replace the present Canadian Bank of Commerce at the intersection of Jordan Street, for which sketch plans have been prepared.

The new Merchants' Bank, however, differs from the others in that it offers no space for the rental of offices, but is intended solely for banking requirements. The design, which is a free adaptation of Italian Renaissance, readily denotes the purpose of the building. The lower facade is of granite to a height of 13 feet, and with the heavy bronze doors of the entrance conveys a sense of security which is a desirable note in bank building design. Above this is a column and pilaster treatment carried out in Indiana limestone. The columns are two and a half feet in diameter and 26 feet high, terminating in an open balustrade with a four foot recess to the upper floor.

One enters through bronze revolving doors to a vestibule with three low steps leading to the banking room. The result here shows a well-controlled expenditure, in which a pleasing effect has been achieved through the treatment and materials employed, rather than by the lavish use of ornament and decorative embellishment. The banking room proper is 66 by 51 feet and 30 feet high. Much of the color effect of the scheme results from the use of different marbles. The walls are of plaster and terminate with a coved ceiling carried out in an Italian treatment with French grey marble pilasters and corbels supporting arched penetrations. French grey marble is also used for the two columns flanking the entrance over which the mezzanine floor is directly located. The walls are in Tokeen marble, the floor of French grey and pink Lapanto, and the counters in verde antique with San Saba marble screens.

BANKING ROOM

A feature of note in the scheme are the four splayed corners which, apart from their architectural effect, have been made use of for

VIEW TOWARD ENTRANCE

NEW MERCHANTS' BANK, KING STREET WEST, TORONTO.

DARLING AND PEARSON, ARCHITECTS

DETAIL OF CEILING; NEW MERCHANTS' BANK, TORONTO

the concealment of smoke stack, fresh air ducts and main floor lavatories. The manager's office and stair and elevators are immediately on the right and left on entering. The banking room is lighted by a ceiling light, 20 by 36 feet and by the three high windows of the mezzanine floor. The public space is 17 by 51 feet, and a uniform width of 17 feet is provided behind the counters, so as to give comfortable working conditions.

On the second floor are offices, women's locker room, rest room and lavatories. The gallery or mezzanine across the front which is used for clerical space is 14 feet wide by 41 feet long and has a 17 foot groined plaster ceiling. The third floor contains a dining-room and a kitchen for the staff.

The building is of steel construction with re-enforced concrete floors and hollow tile partitions. The safety deposit treasury and bank vaults are located in the basement together with men's locker room and lavatories, and a boiler room with modern mechanical equipment.

MEZZANINE: NEW MERCHANTS' BANK, TORONTO

BIRD'S EYE VIEW OF PROPOSED MEMORIAL GARDEN VILLAGE AT ANCASTER, ONT.

In laying out the village the general nature of the ground which is rather rolling, has been considered. The roads swing round low contours, this being not only more economical than the gridiron plan but lends itself to a much more effective treatment from an æsthetic point of view. The approach to the property from the radials is through a very fine avenue about a quarter of a mile long. Where possible houses front on open spaces. An open air school is provided for children who are suffering from chest or lung complaints; the township school for other children being a little more than half a mile away. The workshops which will form a distinct industrial feature of the development, are situated at the cross roads on high grounds. A community hall in the small park area occupied by the open air school, is also shown in the plan with a large recreation ground immediately beyond. The scheme is to incorporate a complete water supply service and sewerage disposal system. Various types of houses are contemplated to accommodate different size families, the 'Ypres' design illustrated being a typical one only.

A Memorial Garden Village

By J. J. Bayliss, Associate Editor of the "Mountain Echo."

An explanation of the proposed settlement sheme near Ancaster, Ont., for tubercular ex-soldiers.

TO clearly understand the position of the sub-normal veteran it should be borne in mind that he has a dual problem. He must have suitable work and a suitable home. It is almost useless to give him one without the other. This is not theory. It has been proved in numberless cases. Men have been given suitable work with the hours advised by their doctors, but, owing to some untoward home condition, they broke down. On the other hand, men have been given ideal home conditions, but, owing to unsuitable work or excessive working time,, they too broke down. Therefore, it would be a waste of time, to plan any scheme that did not provide for both. This is fully realized by all who have investigated the question.

Many schemes of "colonization" have been suggested, some so Utopian and visionary that comment is unnecessary. Some have been rejected because of excessive cost; others have been opposed by the patients themselves, and still others were so complicated and involved that administration would be impossible. In complete contrast to these is the plan proposed by Hamilton ex-soldiers for a Garden Village near Ancaster Ont. It represents a simple solution, the expenditure will not be excessive and it has not only the approval of many tuberculous workers, but, also, the approval of the Parliamentary Committee appointed by the government to investigate the question. The scheme may be called an "Industrial Community," a "Settlement," or a "Subdivision." Actually it is the establishment of a workshop, a short distance out in the country, with a number of reasonably priced houses provided for the workers, who, in every case, are prepared to purchase them on easy terms. In connection with this is a farm, which may be either run as a unit or sub-divided into small holdings. Such a scheme could be called neither visionary nor impractical. It is born of the sternest necessity.

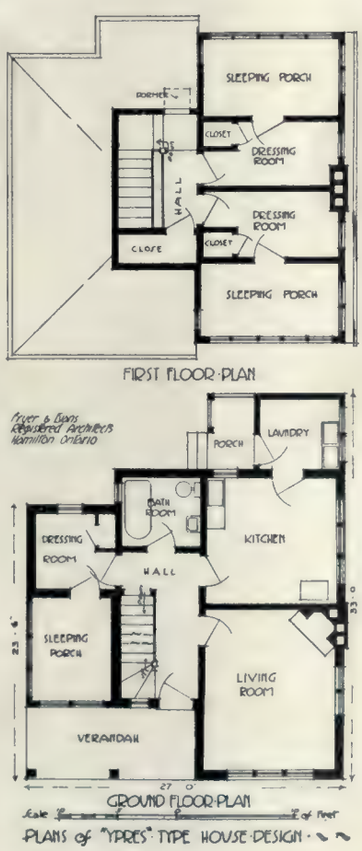
After much work and study of conditions among disabled soldiers the Dominion Government, two years ago, established, as an experiment, a number of workshops for these men, in different cities, and these have proved that the man who can only work part time, can work and earn. The shop in Hamilton is one of the most successful of these. The principal product turned out at present, is light articles of woodwork, but any light manufacturing should prove satisfactory. A workshop similar to this will form the main industry of the "Community" under discussion. Other small industries will also be encouraged and several applications have been received. It is almost certain that the government will establish and subsidize this part of the work, once the queston of housing and administration can be arranged. The farm is large enough to allow of subdivision into a number of small holdings,

Features of special note in the plan are:

(1) Sleeping porches with heated dressing rooms adjoining. The one on the lower floor is for the use of the disabled ex-soldier who is undergoing treatment and saves the strain of climbing stairs should he be compelled to rest for any length of time, in addition to doing away with the necessity of his wife running up and down stairs in attending him. These sleeping porches are enclosed with glass sash to open out; the space between the houses being sufficient to ensure full privacy.

(2) Bathroom on ground floor adjoining dressing room and kitchen. This is of special convenience, in addition to being more economical in the matter of plumbing.

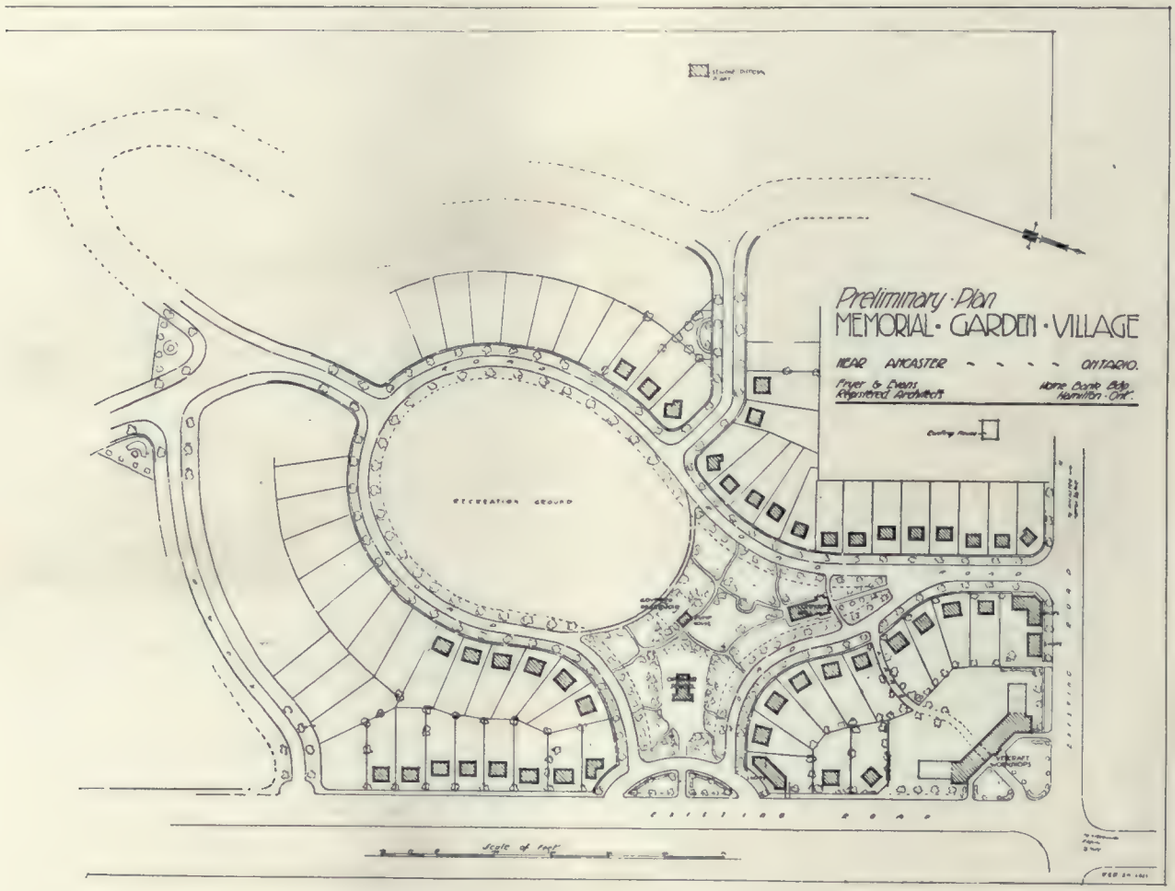
(3) Combined laundry and kitchen adjoining regular kitchen, which is more convenient than the cellar laundry, saving unnecessary steps and labor in the house work and providing a desirable extra room or outside kitchen for the summer months.



PLANS of "YPRES" TYPE HOUSE·DESIGN

to enable the men to go in for poultry, bee-keeping and hog-raising. These small two and three acre gardens are highly recommended for certain types of invalids.

The housing question is the most important of all, as it takes in the question of water supply, sewage disposal, and many other minor but extremely necessary details. Broadly speaking, it may be said that the ordinary city dwelling is entirely unsuitable for those who have suffered from tuberculosis. Fresh air and direct sunlight, which physicians tell us are two agents necessary to health, are excluded from most dwellings. Windows are too small, or in the wrong places. Stairs and closets are wrongly situated. Sanitary conditions are poor. In a word, the majority of workingmen's houses are improperly planned, and demand the maximum, instead of the minimum amount of work from the wife and mother. Even with these handicaps, rents are so high as to be almost prohibitive, leading inevitably to overcrowding, a condition which indeed is responsible for the present hardship of our ex-Sanatorium patients, and the reason why tuberculosis workers are so insistent in their demands that suit-



BLOCK PLAN.

able homes be provided for the men and their families.

The ideal house, for the ex-patient, need not have any expensive "frills"; indeed the simpler it is the more satisfactory it is, from every point of view. Certain things are essential, however, as a sleeeping porch for the patient, well ventilated bedrooms and living rooms for the rest of the family, and windows placed so as to give tthe maximum of sunlight. A completely equipped bathroom is absolutely necessary, as is, also, a good heating system; a large veranda is desirable, but above all, the house should be properly planned. The idea of planning a house "to save steps" is wholly commendable, as in most cases the wife and mother is the housekeeper, and on her devolves all the work when the husband is sick. The easier it is on her the greater will be her efficiency. This is of no small importance where there is a large family. With the husband sick for even a short time the extra work, in many cases, seriously affects the health of the wife and thus helps to extend the vicious circle. It may be taken for granted that the easier it is for the wife, the better it is for the patient. If the wife gets seriously ill the condition of the patient and his family is wholly pitiable.

To secure a house with these essentials, in the average city, at a reasonable figure, is today quite out of the question. It naturally follows, then, that when the Ancaster scheme was put forth it was accepted as a welcome proposal.

Site is Considered Ideal

The site chosen may be considered ideal. It is a short distance out from the city of Hamilton, near a radial line, and close to a good road. The land is slightly rolling, the greater portion at present being under cultivation, though there is some wood land at the back. Water may be easily secured by drilling, and there are already a couple of flowing wells on the property. It is bounded by two roads, and the soil is a sandy loam, suitable, in every way, for light gardening.

A big, old-fashioned brick dwelling, the original farm house, could be made into a most comfortable hostel or boarding house for immediate use, at a small cost. There would be accommodation for 15 to 20 men. The grounds surrounding the house are quite attractive, with some fine old trees, both hardwood and evergreen. While some little distance from the site of the village of Ancaster proper, it is still

near enough to be within an easy walk. The renovating and furnishing of this as a hostel would be a most worthy work for some of our patriotic associations. There are more than enough men to fill it actually ready and waiting.

The first installment has been paid on the property, the preliminary surveying has been done and a complete plan has been made by Messrs. Fryer & Evans, a firm of Hamilton architects, who have unsparingly given their time and energy to the work. This firm has prepared plans of cottages, ideal from the patient's point of view and possessing artistic features, not usually found in houses of this class. The plans show a most practical and convenient arrangement, combined with the latest architectural features and should prove homes, in the true sense of the word, to those who will be fortunate enough to occupy them. The cottages will be artistically grouped around a "Village Green." Every cottage will have plenty of air and light, and the workshop and stores will be convenient to all.

Great Opportunities For Child Welfare

Among the greatest benefits that the "Community" will confer will be the opportunities for many kinds of child welfare work and what is known as preventive medicine. This is an application of the "cure." A child who shows any tendency towards disease can be taken in time and, with proper care and treatment, can be assured of future health. The doctors will have the opportunity of giving every child the individual attention required, which is impossible at present, and disease that might ordinarily cause a lifetime of suffering may be stamped out when taken in time. It is not too much to say that the benefits that would accrue to the children of patients would alone justify the establishment of such a community. Without this many children will have only a poor chance for a healthy future. The mothers of such children will be among the first to realize this.

The great difficulty will be in raising the money for public improvements, such as waterworks, roads, sewage disposal, etc., for, while the Government may be expected to finance the workshop, the men themselves will purchase the houses, the money for these necessary improvements must, in some way, be found and an appeal must, in all probability, be made to the generosity of the citizens, to provide some of this money.

The village itself will, it is hoped, become a "Memorial." The small park spaces, community hall, schools and other utilities, could each be a smaller memorial in itself, showing by its name that it stood as a remembrance by those who had not forgotten the sacrifices made by the men who will not return and benefitting, in a most tangible way, others actually living, whose sacrifices, while perhaps not as great, are decidedly more lasting.

Asbestos Industry Filmed

The Bureau of Mines, Washington, has recently completed a motion picture film showing the asbestos mines of the Johns-Mansville Company and the various factories and processes in the mining, refining and manufacture of asbestos into its numerous products, such as roofing, insulations, packings, brake linings, asbestos textiles, papers and asbestos woods and other products.

The picture is in four reels and runs in little less than an hour. It has a splendid educational value from an industrial viewpoint, and is available for presentation for clubs, engineering societies, Y. M. C. A. etc., on application to the advertising manager of the company at Madison Ave. and 41st. Street, New York City.

Automobile Magnate to Establish Canadian Plant.

The Leaside Munitions Plant, near Toronto which was completed just at the close of the war, has been acquired by W. C. Durant, founder of the General Motors, Limited, in Canada and the United States, who will utilize the property for the manufacture of Durant Automobiles.

Plans call for a factory production of one hundred cars a day. The existing buildings on the site are to be utilized at once, and new ones are to be erected with a view to having the plant producing by March next. Mr. Durant proposes to manufacture in the Dominion every important part of the car, including electrical equipment and tires. A wood-workiing plant is to be constructed on the property for the manufacture of the bodies of the cars. The main building now on the property is 130 by 640 feet, and will form one of the units of a series of structurs which will constitute the Durant manufacturing plant, and will be used as a machine shop, wherein all motors, axles and transmissions for the Canadian company will be made. The building program also calls for the construction of a three-story assembly plant, 130 by 160 feet, directly to the rear of the present building.

EXTERIOR VIEW.

MOUNT PLEASANT MAUSOLEUM, TORONTO.

DARLING AND PEARSON, ARCHITECTS.

Mount Pleasant Mausoleum, Toronto

BEYOND the resemblance it bears to the private or family vault in purpose, the large mausoleum at Mount Pleasant Cemetery represents quite a different problem involving a more general plan due to the vastly greater accommodation required. It is one of three such structures built in Toronto in the past few years and is interesting in showing the type of building which is being adopted for community burial.

The chapel which is 21 feet high is lighted on both sides with clerestory windows having amber colored leaded glass, and is finished with a panelled ceiling cast in reinforced concrete. Both here and in the treatment throughout the dominant note is one of dignity and extreme simplicity. The pulpit platform at the end is in a recess under a marble arch lined with a deep maroon velour hanging suspended from a richly carved oak moulding. Below the clerestory

CHAPEL

The plan provides in all 1100 crypts, and is divided into a central part consisting of a narthex or vestibule, 19 x 28 feet, and a 24 x 48 feet chapel with 10 ft. aisles on either side leading to a system of transverse corridors. The building itself is 220 feet long by 95 feet deep and Greek in character, being constructed of reinforced concrete with granite exterior walls. the walls are carried out in Tokeen marble with French grey pilasters and columns registered by a simple moulding. The floor is of terazzo tile and the furniture consisting of eight pews, pulpit and three platform chairs is of carved walnut.

Both aisles are separated from the chapel by marble screens eight feet, six inches high.

ENTRANCE TO CHAPEL FROM NARTHEX.

NORTH AISLE LOOKING TOWARD NARTHEX.

MOUNT PLEASANT MAUSOLEUM, TORONTO.

DARLING AND PEARSON, ARCHITECTS.

These aisles lead directly to the crypt corridors consisting of three on each side and one at the rear of the building. The accommodation includes in part sixteen private rooms of different sizes. These private rooms contain five, ten and twelve crypts for family burial, and have small memorial windows in richly colored stained glass left to the selection of the owner.

family crypts in the rear aisles are fenced off by bronze railings, and all private rooms have bronze doors.

The chapel can be heated in extreme cold weather. For this purpose bronze and glass sliding doors have been introduced at the corridor openings making it possible to isolate the chapel whenever the heating system is put into operation.

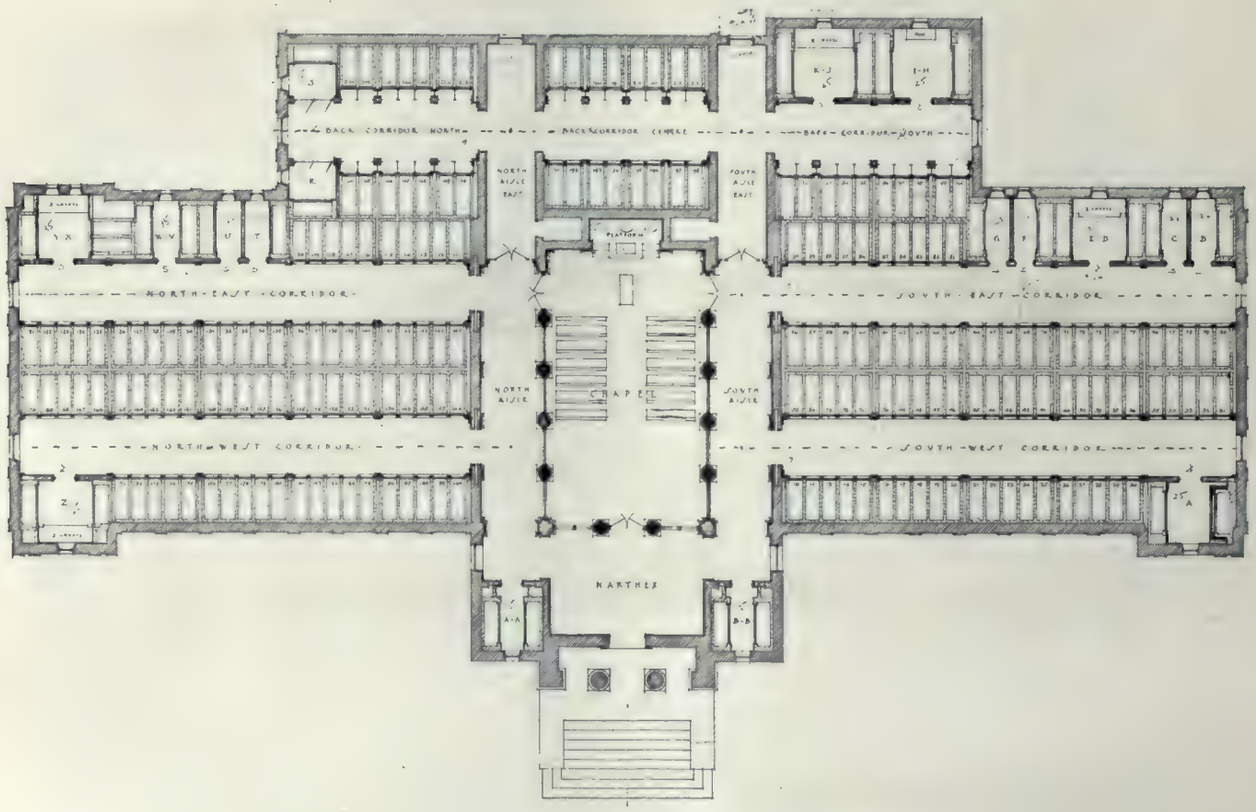
DETAIL OF BRONZE ENTRANCE DOORS.

All corridors are lined with Rex and Regina marble from the Mississquoi quarries, and have floors of Ohio stone. The crypts are of reinforced concrete being arranged in tiers and cast in units of twenty-five—five wide and five high. Each crypt is ventilated and drained and sealed with a concrete slab and then faced with marble. The crypt fronts offer a suitable space for memorial inscriptions and have a ledge or shelf for vases and floral containers formed by the marble projection marking the horizontal divisions between the tiers. The

The building sets in the centre of a spacious lawn and faces west. The entrance is approached by a flight of granite steps leading to a portico, thirty feet wide and forty feet high, supported by two twenty-two feet columns measuring three feet in diameter. The height of the outside walls is thirty feet.

The structure is planned for future extension which will be carried out to the rear when required and which will add several hundred additional crypts to the existing accommodation.

DETAIL OF ENTRANCE



GROUND FLOOR PLAN

MOUNT PLEASANT MAUSOLEUM, TORONTO.

DARLING AND PEARSON, ARCHITECTS.

MOUNT PLEASANT
MAUSOLEUM,
TORONTO

DARLING AND PEARSON,
ARCHITECTS

VIEW ALONG SOUTH AISLE.

FAMILY VAULTS IN REAR CORRIDOR.

TYPICAL CRYPT CORRIDOR.

Town Planning Conference, Montreal

Arrangements have been completed for a Town Planning Conference to be held in Montreal on September 29-30 and October 1, under the auspices of the Montreal Civic Improvement League and the Town Planning Institute of Canada. The conference will be attended by representatives of the City of Montreal and adjoining municipalities, Montreal Board of trade, Chamber of Commerce, Trades and Labor Congress, Manufacturers' Association, Retail Merchants' Association, Builders' Exchange, and Real Estate Exchange.

Addresses will be delivered by prominent speakers on the subject of civic development both as regards its economical and physical aspects. The sessions will be held at the Place Viger Hotel and the first day will be an all-French day, while the last two days will be devoted to papers or discussions in English. The program of the Conference is as followws:—

TOWN PLANNING CONFERENCE
Place Viger Hotel, Montreal

THURSDAY, SEPT. 29th, FRENCH DAY

MORNING SESSION

Registration.

Opening of Conference: Chairman, E. Deville, L.L.D., C.M.G., President Town Planning Institute.

Addresses of welcome by His Worship the Mayor of Montreal and Mr. F. W. Stewart, President City Improvement League.

L'Art du plan des villes"
par M. A. J. Lavoie.

"Les Artères Principales de Montréal"
par M. G. R. McLeod, Ingénieur des Services Technique de la Ville de Montréal.

"L'Automobile et le développement Urbain"
par M. J. A. Duchastel, B.A.Sc., M.E.I.C.

AFTERNOON SESSION

Chairman, E. Deville, L.L.D., C.M.G.

"Les conduits électrique souterraine"
par M. L. A. Herdt, D.Sc., M.E.I.C., F.R.S.C.
Professeur d'electricite, Université McGill,
Officier d'Académie de France.

"Transports en commun et développement de villes modernes"
par M. Paul Serct, M.E.I.C., M.I.C.E., M. Am. Soc. C.E., Ingénieur en chef, Commission des Tramways.

"La Congestion dans les villes"
par M. Aime Cousineau, B.A.Sc., A.M.E.I.C., Ingénieur Sanitaire, ville de Montréal.

"Le Sous sol de Montréal"
par M. Adhémar Mailhist, B.A.Sc.,
Professeur de Geologie, Ecole Polytechnique.

"L'Art Urbain vu par un Sculpteur"
par M. Henri Hérbert, R.C.A.
Montréal.
E. Montpetit, Secretairs de l'Université de Montréal, ouvrira la discussion.

FRIDAY SEPT. 30

MORNING SESSION

Chairman, Mr. Walter J. Francis,
Vice-President Engineering Institute of Canada.

"Suburban Development in Montreal"
by Lenard E. Schlemm, A.M.E.I.C.

"The Tenure of Land and its effects on Town Planning"
by H. L. Seymour, B.A.Sc., A.M.E.I.C., D.L.S., O.L.S., Toronto.

"The Control of Subdivisions"
by Malcolm D. Barclay, B.A.Sc., A.M.E.I.C., Q.L.S., Montreal.

"Economics of Organic Planning"
by Noulan Cauchon, A.M.E.I.C.,
Vice-President Town Planning Institute.
Chairman, Plan Commission of Ottawa.

"City Mapping with Special Reference to Surveying by Aeroplane"
by Douglas H. Nelles, M.E.I.C., D.L.S.
Supervisor of Topography, Geodetic Survey of Canada.
Hon.-Secretary Town Planning Institute.

AFTERNOON SESSION

Chairman, J. Emile Vanier,
President de l'Association des Architectes de la Province de Quebec.

"The Growth of a City with special reference to Edinburgh"
by Ramsay Traquair, F.R.I.B.A.
Professor of Architecture, McGill University.

"The Town Planners Problem in Paris"
by Adrian Berrington, A.R.I.B.A.
Professor of Architecture, Toronto University.

"Parks and Park Systems"
by Fred C. Todd, Landscape Architect, Montreal.

"The relation of City By-Laws to Town Plans"
by Percy E. Nobbs, M.A., F.R.I.B.A.

FRIDAY SEPT. 30th

EVENING SESSION—(PUBLIC MEETING)

Chairman, M. Victor Morin, President de la Societe St. Jean Baptiste.

"Le Plan raisonne"
by Noulan Couchon, A.M.I.C.E.
Vice-President Town Planning Institute.
Chairman Plan Commission of Ottawa.

"The Montreal Situation"
by James Ewing, M.E.I.C.
Vice-President Town Planning Institute.

Adresse par M. Joseph Beaubien,
President de l'Union des Municipalites de la Province de Quebec.

"The Railway Problem in relation to the City"
by W. F. Tye, Past President Engineering Institute of Canada.
Late Chief Engineer Canadian Pacific Railway.

SATURDAY OCT. 1st

MORNING SESSION

"Rapid Transit in relation to City Development"
by F. Stuart Williamson, M.E.I.C., M. Am. Soc. E.

General Discussion on the Law and Financing of the City Plan.
Led by W. D. Lighthall, K.C., Member of former Metropolitan Parks Commission.

Unfinished Business.

Luncheon.

A dinner for the delegates will be held on the evening of the first day, and following the final session on Saturday morning there will be an excursion on the river and an inspection of the Montreal Harbor by courtesy of the Harbor Commissioners. The direct outcome of the conference will probably be the formation of a Montreal branch of the Town Planning Institute of Canada.

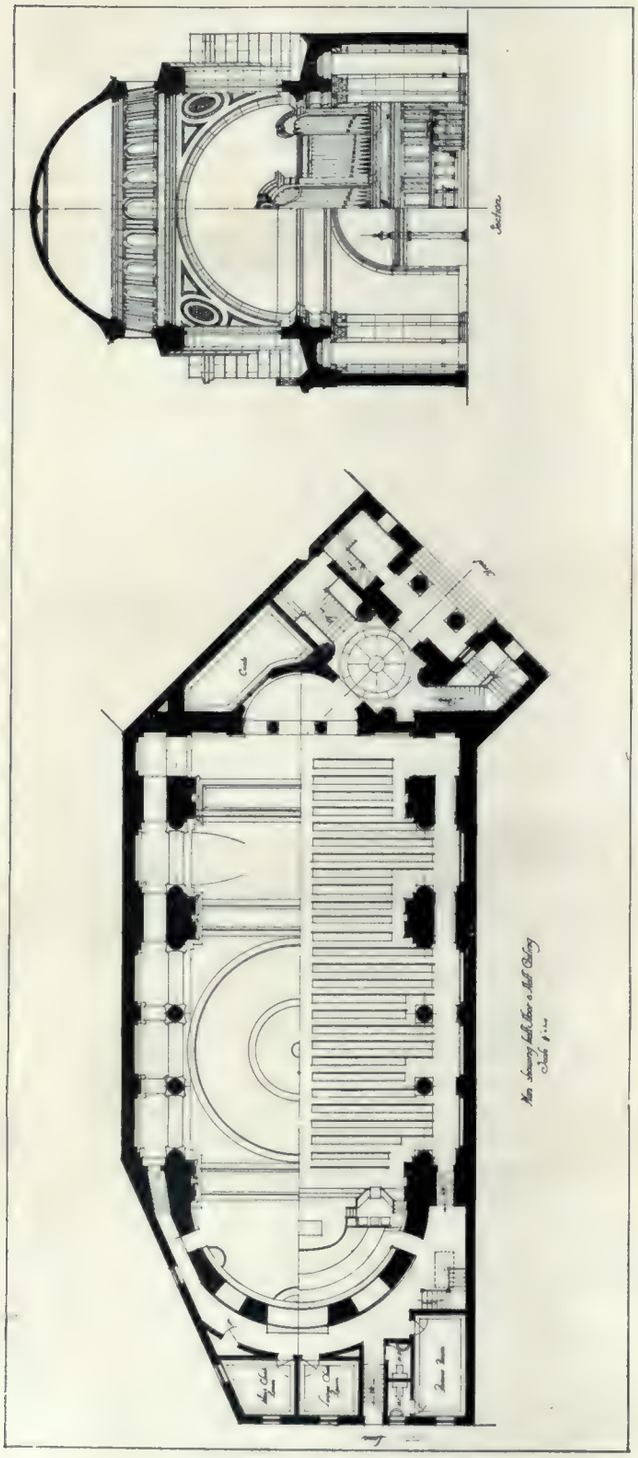
FIRE TESTS ON COLUMNS

An experimental investigation of the resistance of building columns to fire and to fire and water has been conducted by the U. S. Bureau of Standards in co-operation with the Associated Factory Mutual Fire Insurance Companies and the National Board of Fire Underwriters. The fire exposure was produced by placing the column in the chamber of a gas-fired furnace, whose temperature rise was regulated to conform with a predetermined time-temperature relation. The test columns were designed for a working load of approximately 100,000 pounds, as calculated according to accepted formulæ. The working load was maintained constant on the column during the test, the efficiency of the column or its covering being determined by the length of time it withstood the combined load and fire exposure. In the fire and water tests, the column was loaded and exposed to fire for a predetermined period, at the end of which the furnace doors were opened and a hose stream applied to the heated column, the severity of the test being regulated to correspond with the degree of resistance developed by the corresponding type of column in the regular fire tests. In placing the columns and coverings, the work was planned so as to reproduce as nearly as possible conditions in building construction, in point of methods of application and workmanship. The results of the tests have been summarised in terms of hours and minutes of fire resistance afforded by the different types of columns and protections tested. The resistance period is taken as a portion (two-thirds) of the average time to failure in the fire tests, the deduction being made to allow for incidental variations in material and workmanship of columns and coverings as tested and as installed in buildings, and also for differences in load and fire conditions that cause variations in results wth nominally comparable columns. Requirements relative to resistance to water application are limited to ability to sustain load without danger of immediate collapse in case of fire recurring after fire and water exposure.

The resistance periods thus derived vary from 10 minutes for unprotected structural steel columns to eight hours for similar columns covered with 4 inches of concrete made with fire-resistive aggregates and reinforced concrete columns made with the same aggregates. Filling the interior of structural steel columns with concrete gave them resistance periods ranging from a half hour to three and a half hours, depending on the size and shape of the column and the concrete aggregates employed. Single-layer protection of plaster on metal lath applied to structural steel columns gave three-quarter hour resistance; and double layer, with airspace between layers, one and a half hours. Two-inch concrete protection on structural steel columns gave resistance periods from one hour to four hours, depending on the aggregate employed. The concrete made with sand and pebbles high in silica (chert and quartz) developed disruptive effects on exposure to fire, which is ascribed (1) to points of abrupt volume change existing for chert as low as 210 degs. C. and for quartz at 573 degs. C., where it is transformed into the mineral tridymite; (2) to disruption of the pebbles from evaporation of the chemically combined water of the chert, and water enclosed in tiny cavities in the quartz when it crystallizes. Concrete made with trap rock, granite, sandstone, or hard coal cinder aggregate proved superior to that made with siliceous gravel. The highest resistance obtained with concrete made with dolomitic limestone and calcareous sand. The 4-inch concrete protections developed resistance periods from two and a half to 8 hours, the variation with the aggregate being similar to that for the 2-inch.

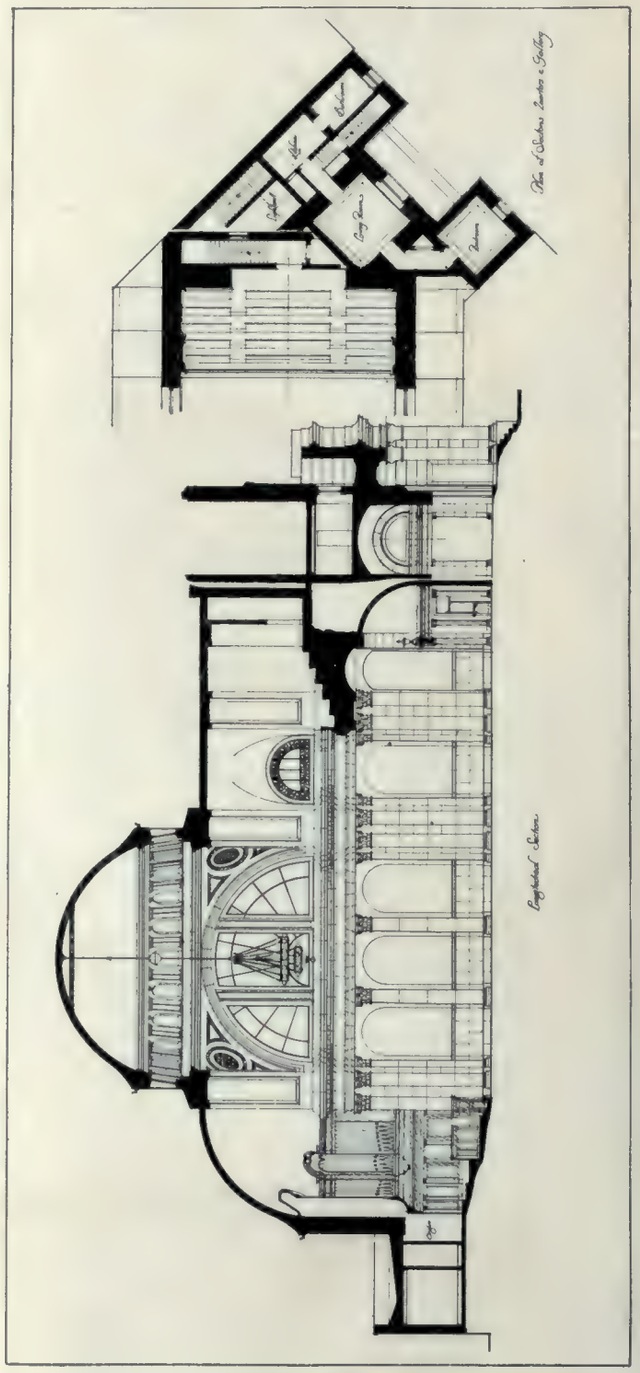
Hollow clay tile on structural steel columns gave periods from 1 hour to 3 hours, depending on the type of clay and method of application. Tile made from semi-fireclay burnt to medium hardness developed greater freedom from cracking and spalling than any other tile tested. Hard burnt semi-fireclay tile evidenced greater effects from fire exposure, and with surface clay and shale tile these disruptive effects were very marked. Little or no difference in resistance was noted as between the 2-inch and 4-inch thickness of hollow tile, the time to failure being dependent on the area of solid material rather than on the thickness of the air space. Filling the interior with concrete or tile appreciably increased the resistance and stability of the covering, and interior metal ties were found to be superior to outside wire ties in holding the tile in place. Solid clay brick set on end and edge to form a solid covering about two and a half in. thick outside the steel proved somewhat unstable on exposure to fire and developed a resistance period of only one hour; while with brick laid flat in the usual manner to form a 4-inch covering thickness, five-hour fire resistance was developed. Solid gypsum block, 2 in. in thickness, laid outside the flanges and edges of structural steel columns and with the space

Concluded on page 282



DESIGN BY A. L. PERRY

THIRD YEAR STUDENT



STUDENTS' WORK

(1920-21).

MCGILL UNIVERSITY,

MONTREAL

Students Work, McGill University

The course in design at McGill University, Department of Architecture, is divided into four classes, which are taken in the 2nd, 3rd, 4th and 5th Years.

The work of the Second Year is on designs of a monumental nature, not involving difficulties of plan.

The work of the Third Year, in which the two designs illustrated were executed, is concerned with small buildings, domestic and public.

The work of the Fourth Year is devoted to larger buildings, and that of the Fifth to problems involving the plan and layout of complex buildings and groups.

The first sketch is done by the student unaided. Assistance is then given, the aim being the development of the student's own idea. The programme set forth for the two Third Year designs presented was as follows:—

A Community Theatre.

The theatre is to accommodate 700 persons seated, of whom not more than 200 may be placed in a balcony.

Accommodation required, in addition to Auditorium and Balcony, if any:

Entrance Lobby with ticket office.
Manager's Office.
Large Foyer, or Assembly Room, to hold 700 persons standing.
Small service Kitchen for light refreshments.
Caretaker's rooms.

Stage. 15 Dressing Rooms. 2 large for supers.
Orchestra Room.
Property Room.
Carpenters' room. Scenery dock. Wardrobe. Green Room.

Site:—In a public park on level ground. A dignified building is required. The total area covered should be approximately 1100 to 1200 super feet.

*Drawings*s—2 plans, 2 Elevations, 2 Seciions, all to ⅛ inch to the foot.

A City Church

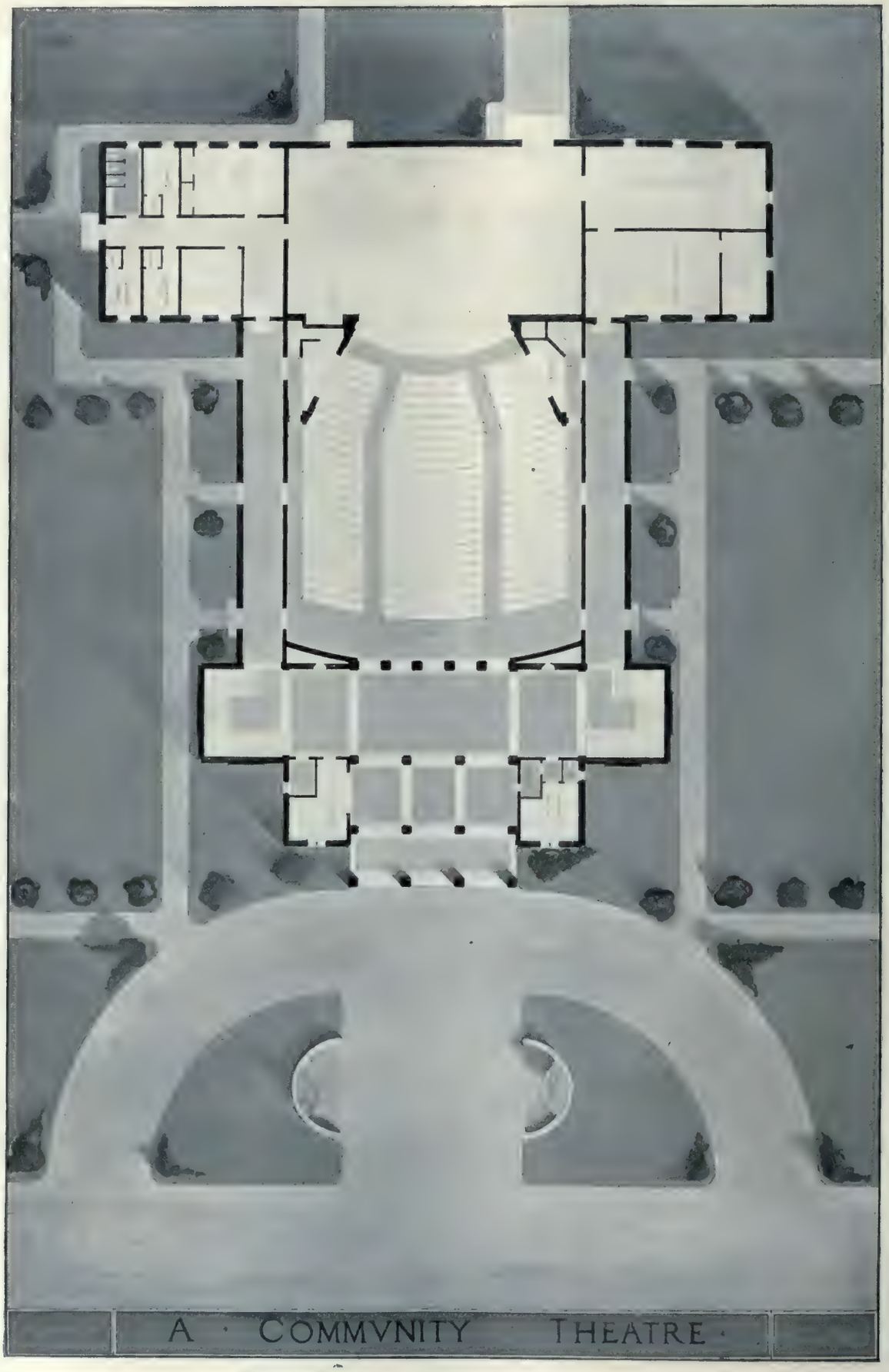
A city church of a formal and monumental design on a confined site; arranged for a religious denomination, the choice of which is left to the student.

Good acoustics, adequate lighting and uninterrupted view of the pulpit, with proper

A CITY CHURCH

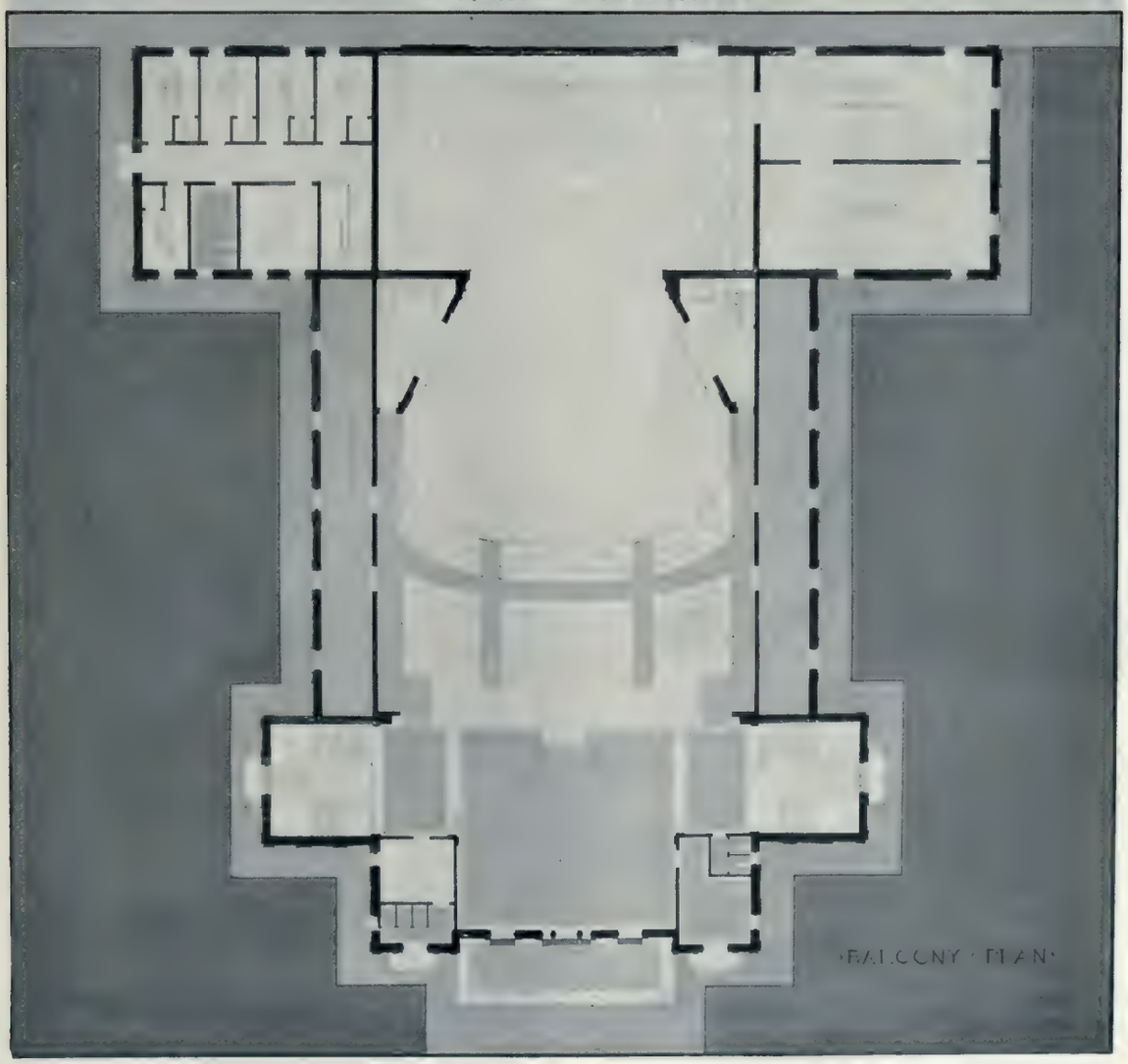
STUDENTS WORK, THIRD YEAR CLASS (1920-21) McGILL UNIVERSITY.

DESIGN BY A. L. PERRY



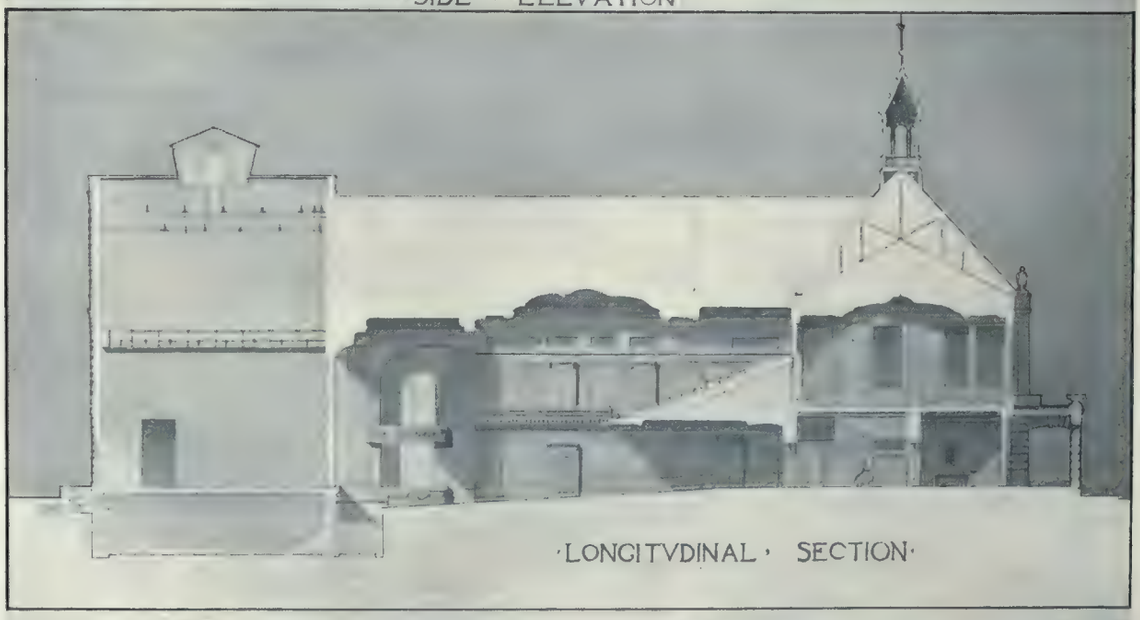
A COMMUNITY THEATRE
STUDENT'S WORK, THIRD YEAR CLASS (1920-21), McGILL UNIVERSITY, MONTREAL
DESIGN BY L. E. BROWN

·FRONT · ELEVATION·

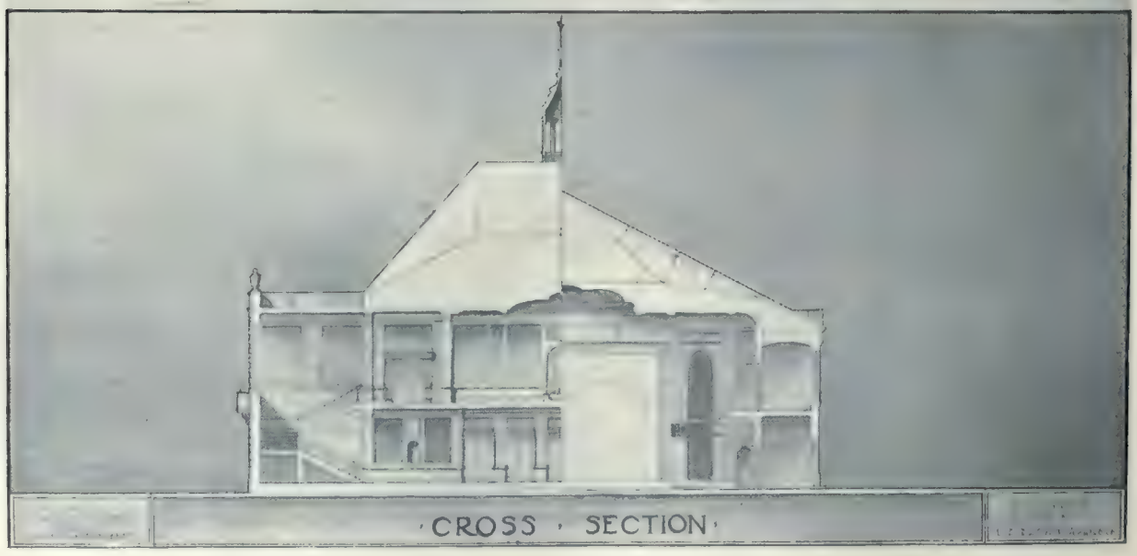


A COMMUNITY THEATRE
STUDENT'S WORK, THIRD YEAR CLASS (1920-21), McGILL UNIVERSITY, MONTREAL
DESIGN BY L. E. BROWN

·SIDE · ELEVATION·



·LONGITVDINAL · SECTION·



·CROSS · SECTION·

A COMMUNITY THEATRE
STUDENT'S WORK, THIRD YEAR CLASS (1920-21), McGILL UNIVERSITY, MONTREAL
DESIGN BY L. E. BROWN

provision for organ and small choir, to be the utilitarian factors for the plan.

It is desirable to concentrate the external architectural treatment on a Tower or Spire at the Main Entrance.

Accommodation :—The maximum amount of seating accommodation that the site will afford is desired, but this must not interfere with the general effect of the interior, which is to be as above specified.

Pulpit, choir and organ space, vestry accommodation for two vestrys and Lavs., etc., (access to these from lane.) Janitor's quarters, consisting of living room, kitchen and one bedroom, with Lav. and bathroom, which, it is suggested, can be put over main entrance. Cloak room accommodation at main entrance.

Materials, Etc. : — Freedom in choice of these is allowed, but a logical relationship be- must be achieved. Methods of construction used to be plainly indicated.

*Drawings*s—Ground and part Upper Plan, showing upper portion of church, etc., Longitudinal and transverse sections; elevation to main thoroughfare, all to ⅛th scale; and ½ inch scale. Detail of some portion, internal or external.

ARCHITECTURAL EDUCATION *

By Lionel B. Budden, M.A. (A.).

Senior Lecturer in Theory of Architectural Design, University of Liverpool.

WHEN I was honoured with the invitation to deliver before this Conference a paper on architectural education, it was intimated to me that what was required was not an elaborate thesis attempting a philosophical survey of the entire subject, but simply the statement of a particular case—the case for the present academic system of training in architecture. To that task, therefore, I shall address myself. I can, of course, only attempt to do so very briefly and imperfectly, as, within the limited time at our disposal, it will be impossible to do more than touch upon the most salient and elementary aspects of the subject.

A reasonable system of training in architecture should, I submit, itself prove satisfactory answers to the following three questions:—

(1) What are the subjects which the architect, *qua* architect, is required to know?

(2) In what way should they be taught?

(3) Under what conditions?

Those three questions raise, I think you will agree, issues that are fundamental to the whole theory of architectural education. The academic position in relation to them—the academic position that is, as I conceive it to be—I shall endeavour to put before you.

What are the subjects which the architect *qua* architect is required to know?

To answer this question, we must first define the functions of the architect. His chief function may theoretically be summarized in a sentence. It is his business, on the basis of a programme of practical and spiritual needs and working through the medium of constructional materials, to devise and erect buildings which shall be efficient for their purpose, and which shall be distinguished by beauty. He is then, on this assumption, first of all required to be an expert in three branches of knowledge. He should understand planning in all its aspects; he should have an intimate acquaintance with materials and construction—with the nature and behaviour of materials under the varying conditions of practice and with the principles and methods of their employment; and he should be able to embody in aesthetic form, to fuse into an aesthetic whole, programme, materials and construction—in a word, he should know how to design.

But the complete architect is called upon to do even more than is indicated in this extremely condensed summary of his duties. He is expected to be thoroughly conversant with a number of technical sciences relating to programme or to construction, such as surveying, sanitation and hygiene; to know and observe the administrative routine and the legal and financial procedures involved in the practice of his profession; and to be competent to present his designs, in the first instance so that they can be understood and visualized by his clients, and in the second so that they are completely explicit to those who undertake to carry them out. He is required, in effect, to be adequately skilled in presentative technique, which involves on the one hand a grasp of perspective, sciagraphy and rendering, and on the other, familiarity with the methods of preparing working drawings. To the primary qualification of the ideal architect, a knowledge of all these subjects must therfore be added.

*Paper read before the Royal Institute of British Architects, on the present system of academic training in England.

Now it will be obvious—common sense and your own experience must both confirm it—that omniscience in the total field of learning which I have outlined is nowadays humanly impossible for any single member of the profession. In antiquity, during the middle ages, throughout the Renaissance, and down even to the beginning of the nineteenth century, it was possible for an architect to acquire all the information that existed under the several heads that I have enumerated. It was possible for him to do more—to make excursions into other arts and sciences and to practise as an engineer, architect, painter and sculptor with equal success. But to-day the immense elaboration of the art of architecture, its vastly increased resources, and the complex nature of the demands made upon it, altogether prohibit any individual from achieving a complete mastery of all the separate elements of its total content. The modern architect is more and more forced to restrict his aim within the sphere of architecture itself. He must select the province that he will make his own, and be content with a knowledge of the general principles that govern the departments of the remainder. It is still possible for the domestic practitioner, whose commissions are of a relatively modest kind, to cope single-handed with such diverse problems, constructional, aesthetic and so on, as he may encounter. But for the architect engaged in more varied and complicated work upon a bigger scale, that course is simply out of the question. Specialisation and collaboration—whether acknowledged or not—are the only means by which a practice of any considerable size and complexity can, under existing conditions, be conducted.

For that state of affairs, then, which we are powerless to alter if we would, architectural education must now provide and the academic system does provide for it. Because no individual can become expert in all the branches of architectural knowledge as they have developed, and because all these branches are yet integral and essential parts of architecture as a whole, the academic school seeks to frame its courses in such a fashion that its graduates shall collectively complement each other's capacities in practice.

There are, broadly speaking, three classes of candidates for admission to the profession: those whose interests strike an approximate balance between the constructional and the aesthetic aspects of architecture; those who are chiefly attracted by construction: and those main pre-occupation is with design. Two numerically categories also exiist: the candidates whose natural aptitude is for the legal and administrative side of practice—they tend to group themselves with the constructionalists; and the candidates who are first and foremost draughtsmen and colourists—they inevitably ally themselves with the designers.

The main triple division here indicated corresponds to the main triple divison that obtains In practice—the local practitioner, the constructional expert and the designer; and to them may be added the professional arbitrator and the perspective colourist.

To meet the needs of these three main groups and of the smaller groups related to them, the academic system offers three courses of training, each of five years' duration and all identical in character up to the end of the third year; for a basis of common knowledge is indispensable to efficient collaboration in the end. The first course is one that is taken at a pass level and is framed to prepare graduates for the simpler type of general practice. The other two courses lead to honours or distinctions—in the one case in construction, in the other in design—and are intended to provide the initial equipment necessary to specialiist work in those spheres. All three courses are purely technical, and comprise only such subjects as relate directly to architecture; and each involves office experience.

The first three years, the curriculum of which is common to all three courses, first, continuous studio-work in architectural construction and in design, supplemented by measured studies of existing buildings; and secondly, lectures in the history and archaeology of architecture, in the theory of architectural planning and design, in applied geology, physics and mechanics, in construction (including laboratory demonstrations in strength of materials), in surveying, sanitation and hygiene, in descriptive geometry, sciagraphy and perspective, and in presentative technique and rendering. Students taking the so-called "ordinary" course then proceed during their fourth and fifth years to further studio-work in design and construction, the latter involving the preparation of working drawings. Lectures on construction, on specifications, estimates and contracts, on professional practice, and either on decoration and furniture or on the history of ancient art form the remaining part of the school curriculum for those years. In the fifth year a thesis is required showing advanced and individual work in *one* of the following alternative subjects—either in historical architecture or in the theory of architectural design, or in science as applied to construction or in architectural design itself. Students who specialize at the end of their third year, if they are constructionalists, take a course which goes beyond that of the pass type. It prescribes as additional subjects,

reinforced concrete and quantity-surveying, and limits the choice of thesis to a special study of an application of science to definite problems in architectural construction. Similarly, candidates registering for the course with honors or distinction in design must take, in addition to the subjects of the ordinary curriculum, lectures on advanced architectural programmes, civic architecture and landscape design, and must offer a thesis which is either a direct or indirect exposition of architecture as an art. In all three cases a period of six months in each of the last two years has to be spent in the office of a practising architect—unless civic design be taken as an optional additional subject, when the whole of the fourth year must be spent in school work.

Separately and together these three courses constitute the academic answer to the first question, what are the subjects which the architect in his professional capacity is required to know? Let us now proceed to the second: in what way should these subjects be taught?

As the pupilage system may be said to be *in extremis* in all but the most remote parts of the country, it is not necessary to waste words in exposing its defects or in emphasising how inevitable was its supersession by scholastic training in architecture. Issues less finally determined may be discussed with more profit. The new academic courses have provoked certain criticisms which it is important to meet. It is said that they are over-elaborate, that the programme of studies set forth in them is too heavily loaded, and that they tend to make the teaching of architecture an analytic rather than a synthetic process.

To the first objection I would reply that none of the subjects comprised within the course I have outlined has been included from a desire to inflate the importance or exaggerate the difficulties of training in architecture. They are all integral parts of architectural education as a whole, can be shown to be so and must be accepted as such.

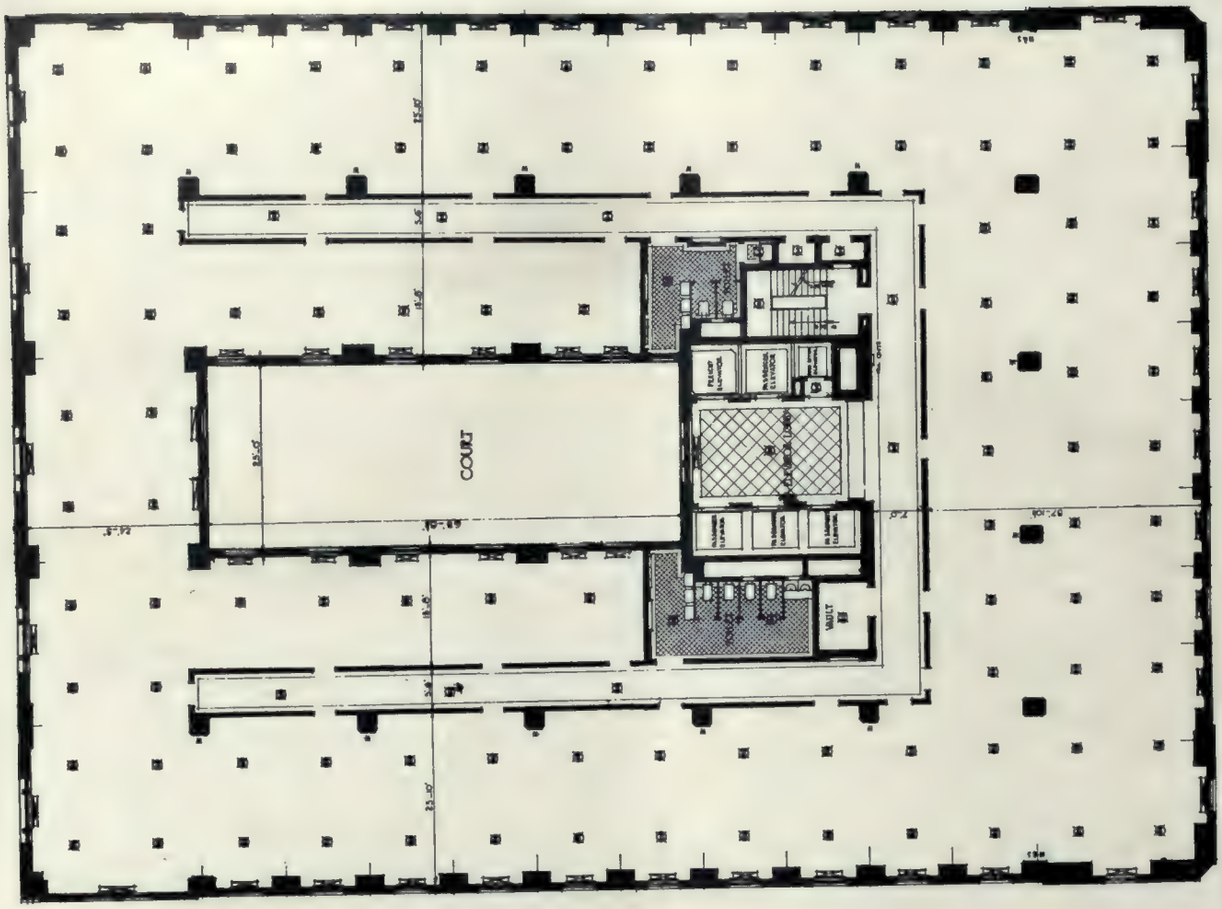
The second criticism—that the programme of studies is too heavily loaded—has, I would claim, a justification that is more apparent than real. To architects not actually engaged in teaching work the schedule of subjects may seem very lengthy. But it must be remembered that the complete courses of study extend over five full years. Only the subjects of major importance run throughout the entire length of any one course. Others occupy only a portion of the whole—some extending over two years, some over one year, and some over no more than a term. They are arranged on a progressive interlocking system, and so arranged they do not impose an excessive strain on the capacity of students.

With regard to the third contention—that academic education in architecture is tending to become altogether too analytic, that it is putting in watertight compartments subjects that ought to be treated in the closest possible connection—I would submit that this is not so. The studio-work in an architectural school, if it be properly controlled and developed, is the synthetic product of the whole teaching of the school. In it is, or ought to be, summed up the knowledge which it is the aim of the separate lecture courses to communicate. Those lecture courses must themselves treat of their own proper subjects individually and separately; for there is no method, of which I am aware, whereby one subject can satisfactorily be taught in terms of another. But these distinct branches of knowledge can be brought together and unified in the work of the school studio. And under the new academic courses they are so unified.

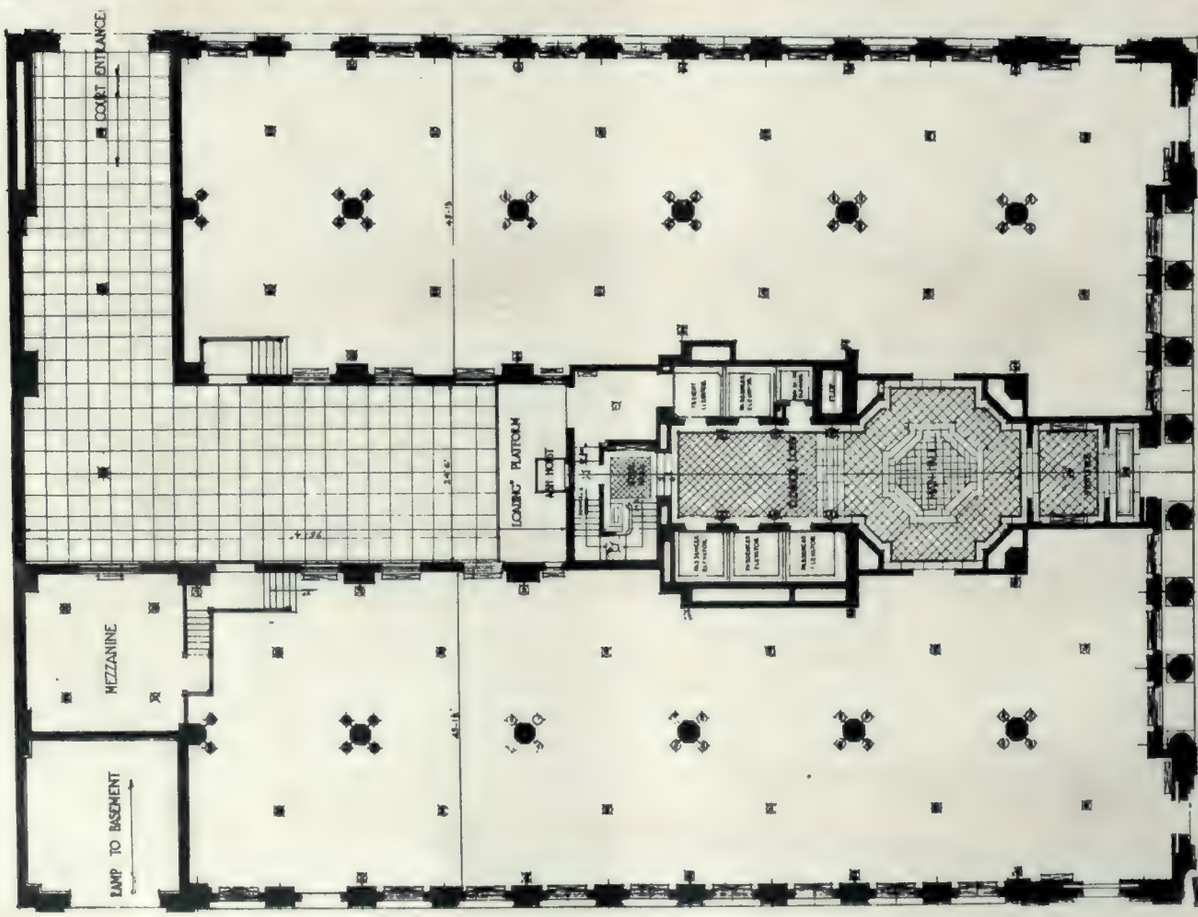
I come now to the last of the three questions to which I originally proposed to attempt an answer: under what conditions should architectural education be administered, by what bodies, under what auspices? The requirements of the kind of training that I have endeavored to describe point, I would maintain, to the same conclusion, that the Universities alone, actually or potentially, possess the means to satisfy the whole claims of architectural education. Those claims, you will agree, are not merely technical; they are moral also; and it is only fitting that the courses I have outlined should be crowned by an academic degree. The dignity of our profession and its right to public esteem alike demand it.

Two years ago the Royal Institute of British Architects stood committed to a centralised system of examination which deprived those actually responsible for the real work of architectural education of a legitimate share in its ultimate control. That and many other evils were the consequences of the system then maintained. Subsequently, the Institute, under sufficient safeguards, very wisely, and with infinite benefit to architectural education generally, decided to delegate, to such authorities as might justify the privilege, the qualifying powers which they are most competent to exercise. By this act of high policy the Institute took an initial step of immense importance. It recognised that the administration of architectural education should rest, not upon a metropolitan, but upon a national basis; it resolved to use, not simply the resources of London, but those of the whole country.

Concluded on page 282



TYPICAL FLOOR PLAN



GROUND FLOOR PLAN.

CANADA CEMENT COMPANY'S BUILDING, MONTREAL, NOW IN COURSE OF ERECTION.

BARROTT AND BLACKADER, ARCHITECTS.

Canada Cement Building, Montreal

The Canada Cement Company's building facing Phillip Square and completely occupying the space between Union Avenue and Phillip Place, will upon completion be an office building of most modern design, construction and equipment.

The site is one of the most desirable business locations in Montreal. It is conveniently close to both the uptown and downtown districts and is on the main thoroughfare of travel between the retail and financial centres of the city. It is free from the noise and clatter of traffic, but easy of access by all methods of transportation.

The building will represent the best results obtainable from the use of concrete and reinforced concrete construction. It is to be ten storeys in height above the street level with an additional basement floor. There will be approximately 14,000 square feet of rent area on each floor. The facades on Phillip Square, Union Avenue and Phillips Place, will be of hand tooled granite and the south wall and courts will be faced with hydro-stone. The corridor and interior finish are to be simply treated, only the best materials being used, the construction of the building being fireproof throughout.

One advantage of the location is that it assures for all time unobstructed light on three sides, an advantage possessed by few office buildings. In addition there will be a court opening at the back, 26 feet wide and 25 feet deep. The plan permits of an exceptionally fine layout, as typical offices on the street sides are in no case to be more than 24 feet deep, while those on the court opening will be but 15 feet deep.

The building will be equipped with four gearless traction elevators with a speed of six hundred feet per minute, an automatic elevator and a separate freight service. Additional conveniences include adequate toilet and lavatory accommodations on each floor. In the basement will be safety deposit vaults available to the tenants, while space has been reserved for two banks on the ground floor.

CANADA CEMENT COMPANY'S BUILDING, MONTREAL.
BARROTT AND BLACKADER, ARCHITECTS.

The contract for the building calls for its completion by April 1922.

Architectural Education

Continued from page 279

Still further and not less pressing obligations remain to be fulfilled. In the government of architectural education the Institute has adopted and, in certain cases, has put into effect the principle of devolution; it has not yet, however, determined whether the educational destinies of the profession shall ultimately be entrusted only to bodies enjoying the highest status and prestige, or whether instruments of lesser authority shall be its recognised agents. Upon its decision in this matter the future welfare of the profession will depend. That at least must be the view of those who believe in the final value and paramount claims of academic education in architecture.

Fire Test on Columns

Continued from page 271

between blocks and flanges filled with gypsum mortar, gypsum blocks, or poured gypsum filling, gave one and a half hours' resistance; and similar coverings made with 4-in. solid blocks gave three and a half hours' resistance, the failure being due in all cases to shrinking, checking, and disintegration of the blocks which caused them to fall off and expose the steel.

Round hollow cast iron columns developed 20 minutes' fire resistance as tested unprotected, and a half hour resistance when unprotected and filled with concrete. Protections approximately 2 in. in thickness and consisting of Portland cement plaster on metal lath, hard coal cinder concrete, or round porous semi-fireclay tile increased their resistance period to two hours. Steel or wrought pipe not smaller than the 6-in. standard size, filled with 1 : four and a half concrete, gave a resistance period of 25 minutes; and similar pipe, not smaller than the 7-in. standard size, filled with concrete and reinforced in the fill with structural angles, resisted three quarters of an hour.

Reinforced concrete columns with 2-inch integral concrete protection gave 5 hours' resistance as made with trap rock aggregate; and 8 hours' resistance with limestone aggregate.

Pine and fir timber columns with unprotected cast iron or steel caps gave 25 minutes' resistance; with column and cap covered with three-eighths of an inch gypsum wall board gave three-quarter hour resistance; and with protection of Portland cement plaster on metal lath gave one and a half hours' resistance. The cause of failure of the timber columns was loss of strength of the wood at the cap bearings due to conduction of heat from the flanges of the metal caps to the bearing plates and into the wood, which caused it to soften, crush and induce slipping or fracture of the caps.

R.A.I.C. and O.A.A. Agenda

Present indications point to a very large attendance at the joint convention of the Royal Architectural Institute of Canada and the Ontario Association of Architects, which is to be held on October 10th and 11th, at the King Edward Hotel, Toronto. With the exception of one or two papers, the business sessions will be entirely taken up with discussions dealing with the question of legislation and other important matters now before the profession. An address will be delivered by Irving K. Pond of the American Institute of Architects, who will be one of the invited guests, while other prominent speakers will address the luncheon on both days. At the conclusion of the final session, the visitors will enjoy a motor drive to points of interest, followed by a dinner at the National Club as guests of the R. A. I. C.

The program of the convention subject to enlargement, is as follows:

R.A.I.C. AND O.A.A. JOINT CONVENTION

King Edward Hotel—Toronto

Monday, October 10, 1921

9 a.m.	Meeting 1920-21 Council O.A.A
9.30	Meeting 1920-21 Council R.A.I.C.
10.30	First session O.A.A. Election of Council—Appointment of Delegates.
12.30	Meeting of 1921-22 Council O.A.A.—Election of Officers.
1 p.m.	Luncheon at King Edward Hotel. Invited Guests:— Lieut.-Governor Cockshutt, Premier Drury or Minister of Education; T. L. Church, Mayor; Messrs. Home Smith, Harbor Board; P. W. Ellis, Transportation Commission; John McClelland, Board of Education; David A. Carey, Separate School Board; Robert Fleming, Canadian National Exhibition.
2.30	First Session, R.A.I.C. Address on "Architectural Education" by Professor Berrington, University of Toronto.
6.30	Dinner at Arts and Letters Club (Informal), Guests of O.A.A. Speakers: Mr. Gilbert E. Jackson, University of Toronto; Mr. Geo. H. Locke, Chief Librarian, Toronto; Film lecture by a representative of the Indiana Limestone Quarrymen's Association.

Tuesday, October 11, 1921

9.30a.m.	Joint Business Session of R.A.I.C. and O.A.A. Committee Reports; General Business. Address by Irving K. Pond of the American Institute of Architects.
12.30	Meeting 1921-22 Council.
1 p.m.	Luncheon at King Edward Hotel. Address on "Financial Viewpoint of the Building Industry" by Mr. W. G. Watson, Toronto General Trusts Company. Invited Guests: Messrs. J. P. Angliin, President of the Canadian Association of Building and Construction Industriies; Mr. Tom Moore, Council of Labor.
3.30	Motor Ride.
6.30	Dinner, National Club, (Informal), Guests of R.A.I.C. Invited Guests: President of Royal Society; President of the Royal Canadian Academy.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO, - - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:

MONTREAL—171 St. James Street
E. J. Shearman, Representative.

WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned. Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto September, 1921 No. 9

Better Building Prices

Notwithstanding the feeling which exists in the public mind as regards present building costs, tenders submitted in connection with work in the architectural offices show an average reduction of 15 per cent. as compared with prices of twelve months ago. While the reduction varies above and below this figure according to the type of building in hand, it is pointed out that particularly as regards industrial buildings, where unskilled labor and standard methods are large factors, a much better saving is to be effectted.

This improvement in price conditions should not only justify a more optimistic outlook, but in itself is an inducement which should warrant much deferred work in going ahead. In fact, according to published reports, the most conspicuous betterment in any branch of Canadian industry during recent weeks is that noted in building and construction operations. In the month of August the volume of new contracts amounted in value to over thirty-six million dollars. This compares with less than eighteen million in July and is more than double the total for August 1920. Indeed as much new work was actually started in August as in the previous seven months of the year. An analysis shows that public works and utilities are now providing employment for a much larger labor force than a while ago. Business buildings are also being erected in greater number, while residential and industrial buildings stand at the bottom of the list. For the month in question Ontario easily leads, accounting as it does, for twenty million of the thirty-six million aggregate. The four western provinces report about ten million in new contracts, Quebec five million, while the figures for the maritime provinces are for lesser amounts.

Undoubtedly much of the present activity can be ascribed to decrease in costs to date, due to the drop which has so far taken place in the price of materials, and the increased efficiency of labor. The feeling is that costs will not recede very much from where they are today. On the contrary the opinion is that a return of building operations to normal will mean a stiffening in prices. While much will depend on general conditions, the feeling is that the more stabilized conditions prevailing are having a tendncy to restore confidence, and that on the basis of the present season's activities the outlook at least is altogether more promising.

Ontario Town Planners to Meet in Toronto

At a recent executive meeting which convened at Toronto, plans were discussed for this year's convention of the Ontario Town Planning and Housing Association to be held in Toronto at Massey Hall, and which will be attended by a large number of delegates from all parts of the province. While not definitely announced, October 31st and November 1st have been practically settled upon as dates for the convention.

Those present at the preliminary meeting were: Mr. J. P. Hynes, Toronto, president of the Association; P. S. Morris, Hamilton; Ald.

Frank Harley, London; J. P. Jaffray, Galt; F. Howard Annes, Whitby; G. F. Beer, Toronto.

At the convention it is expected several experts from the Chicago City Planning Commission will deliver addresses. Papers will also be read by Dr. H. L. Brittain of Toronto and G. W. McLaughlin of Oshawa. All the problems which affect growing municipalities will be taken up and the Dominion and Provincial governments will be asked for aid in the work in the way of necessary legislative enactments.

The Use of Advertisement

By Dudley Harbron in "The Builder," London, England.

If we are to have propaganda and publicity for the art of architecture and architects, it must be accompanied by reasond criticism in order to prevent abuse. The average citizen is a simple, trusting sort of fellow, who believes what he is told—if he is told often enough. He cares little for the grammar of the arts, be it proportion in architecture, technique in painting, or prosody in poetry. Yet if you speak with him in the train or on the bus, you will find that he is not averse to enter into conversation on the merit of a poem or picture, that he knows something of the life and character of their authors, and that his judgment, wrong though it may appear to be if you belong to some narrow clique, is roughly sound.

The reason for this is simple. The sayings, the doings, the comings and goings, of the poet, together with portraits of himself, his wife and family, are blazoned in the Press, not because the average man wants to read about them, but because the publisher wants the average man to buy the poet's works. Autobiography, social snippets, and, finally, biography, keep him in the limelight. His friends write to the Press to inquire who wrote some line or other that they confess is running in their head but of which they cannot locate the author, and some obliging relative hastens to supply the name or the writer and publisher, whilst she thoughtfully does not forget the published price.

It is not contended that that system produces literature, any more than a similar state of affairs would make architecture. It does, however, cause the man in the street to talk and think in a familiar way about people and subjects that are really quite beyond his ken. If the "puff" paragraphs were all he had upon which to base his estimate there would be nothing to urge in their favour, but they are not all; side by side with this inspired information can be read keen criticism of the writer's imperfections and stupidities, in which his merits are assessed quite apart from any question of personal charm or brusqueness, social standing, or inferiority. Thus, sound criticism acts as a deterrent to incompetent work, and, like weeding, improves the plants that remain in the garden after the hoe has performed its task.

The sister arts of painting, music and sculpture are all very much in the same case, and so far as publicity is concerned they have one advantage in common that lends itself to advertisement in that they are all easily reproducible. Being methods of expression of emotion, they appeal to the ordinary man who cannot enunciate a philosophy, but who recognises one when it is formulated for him. Although architecture is as expressive as any of the arts, and capable of producing a like emotion in the beholder, it is difficult to advertise because the emotion is incapable of multiplication, it is so often anonymous, and always inarticulate. It cannot be too often pointed out that our art is a reflex of society, in all its diversity. Pompous banks, parsimuoious churches, mean streets, are as significant as otherworldly cathedrals or Roman walls; they mark but years of human struggle and endeavour. They are not finality or perfection; what beauty they possess is in their appositeness; what deformity they reveal is not of themselves but of the body politic—without respect for race or creed. Once he grasps this the average man will see with knowing eyes, and read the message in the silent stone.

Genius is in no need of advertisement—it thrives in adversity and fades in prosperity. If it has a message to give it is delivered. It is to lift the level of mediocrity that is the function of publicity. It is to assure that the artist shall have an instructed audience, and not perform to empty benches for his own delectation. If architecture is to interest it must not be so shy, the anecdotage of the profession must not be confined to the omitted staircase, the bill of extras, or the unfortunate victim of Whistler's peacock room.

There are vivid enough personalities amongst our contemporaries without troubling to revisit the shades of Phidias or Cheops for illustration; they are dead, and it is up to us to show that we are alive. For the structure of society, the mentality of the people, has changed since architecture occupied the position of the mistress art and was attended upon by the other arts as handmaidens. It is no use to try to put back the clock. We must try the methods of our times, and if we want advertisement we must tolerate criticism.

Chime Bells for Toronto Church

The belfry of the Metropolitan Church at Toronto is soon to have one of the finest sets of chiming bells obtainable. These bells, to consist of twenty-three pieces, will be the gift of Mr. Chester Massey, and will be cast by Gillet and Johnstone, Croydon, a famous English firm of bell founders.

The tower of the Metropolitan Church is regarded by Messrs. Sproatt and Rolph, architects, as being entirely suitable to carry the superimposed weight of so large a set. The motive power for these bells will be electricity, with a keyboard attachment at the organ. The chimes are to be the very best, and when installed will be second to none on the continent. Not only will they be distinguished by their number, but by an unexcelled purity of tone, guaranteed by their makers' reputation. It is hoped to have the set installed by next spring.

Engineering Institute To Meet In Winnipeg

The next annual meeting of the Engineering Institute of Canada will be held in Montreal on Tuesday, January 24, 1922, and after a brief business session, the meeting will adjourn to Winnipeg, where it will be combined on February 21st, 22nd and 23rd, with the annual general meeting of the Manitoba Branch.

Scottish Water Power Schemes

To lovers of Robert Burns, Ayrshire is a place of almost sacred pilgrimage, and it will come as a shock to learn that the Town Council of Ayr contemplates an ambitious scheme to produce electric power from the waters of Loch Doon, Ayrshire. This is only one of many proposals to utilize the heavy rainfall characteristic of Scotland. All the promisiing sources of water power both in England and in Scotland are being closely surveyed.

Smoke Detecting Fire Alarms

Most automatic fire alarms depend for their action upon the heat of a flame. That is to say, the fire must already have taken hold of the building before the mechanism gives the alarm. As the suppression of the fire generally depends upon an early attack, the time between the actual beginning of danger and the working of the alarm is a serious drawback. In order to overcome this disability, a British inventor has devised an appliance which detects the presence of smoke quite independently of any temperature changes. This smoke detector consists of a metal cylinder about 8 inches long, open at each end, so that air can circulate freely through it. It contains two metal capsules, one considerably larger than the other, and so designed that smoke rising through the cylinder causes one capsule to bend more than the other. This movement completes an electrical circuit, thus ringing an electric bell, or giving any other desired signal. The sensitiveness of the appliance can be adusted so that the presence of casual tobacco or other smoke will not be recorded. It is sufficient that the mechanism should respond only to dense smoke, as almost invariably a room is filled with such smoke before any serious amount of flame occurs.

An Omission

Through an oversight in the August issue we failed to make mention of any architect's name in connection with the garden view illustrated at the top of page 232. As Mr. Bernard H. Prack, Toronto, was responsible for the tea house forming a feature of the subject in question, we wish to take this opportunity to correct this omission and to credit him with the authorship of the architectural design entering into this attractive garden composition.

Personal

C. E. MacDonald has resigned from the International Nickel Co. of Canada, Ltd., for which company he was sales manager for several years, to take a position as manager of the Electrical Alloy Company, Toronto.

Thomas Adams, town planning adviser to the Federal Government, has been invited to act as special lecturer on town planning subjects in the Department of Agriculture, Massacheussets Institute of Technology.

Plan to Construct a Model French City

Major J. A. M. de Sanchez, chief of the economic division of the French High Commission, stated at the conference on reconstruction in France, held in the Engineers' Club of Boston, that the City of Pinon, a little town about ninety miles from Paris, had been selected to combine all the artistic features that make French villages beautiful and all the sanitary improvements that make American cities healthful. It is believed that the work done in Pinon will influence all of that done in the rest of France for generations to come, and, while retaining as far as possible the picturesque atmosphere of the French village of the past, will add those modern features that are conductive to the comfort of home living and the prosperity of communities.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in This Issue.

MOUNT PLEASANT MAUSOLEUM.

Mason, Witchall & Son.
Granite, Stanstead Granite Quarries.
Marble, Wallace Sandstone Ltd.
Marble, Vermont Marble Co.
Roofing, Johns-Manville.
Bronze Work, Arch Bronze & Iron Works.
Glazing, Robert McCausland.
Furniture, Bromsgrove Guild, Montreal.
Fixtures, McDonald & Willson.
Plastering, Hoidge & Sons.
Wiring, Geo. J. Beattie.
Jerrazzo Floors, Italian Mosaic & Tile Co.

MERCHANTS BANK.

General Contractors, Anglin-Norcross Co.
Vaults, J. & J. Taylor.
Kitchen Equipment, Geo. Sparrow & Co.
Hardware, Rice Lewis.
Bronze, Arch Bronze & Iron Co.
Marble, Vermont Marble Co.
Furniture, Can. Office & School Furniture Co.
Lockers, Geo. B. Meadows.
Cut Stone, Scott Bros.
Granite (Stanstead Quarries), Anglin-Norcross.
Clocks, Wm. Ashall.
Linoleum, Murray-Kay.
Vault Protection, American Bank Protection Co.
Elevator

J. P. Anglin, B.Sc., President. *H. J. Gross, Vice-Pres. & Treas.* *C. D. Harrington, B.Sc., Vice-Pres. & Manager.*

ANGLIN-NORCROSS LIMITED

CONTRACTING ENGINEERS AND BUILDERS.

MONTREAL TORONTO HALIFAX

Vermont Marble

The marble used in the Merchants Bank Building and in the Chapel of Mount Pleasant Mausoleum shown in this issue was manufactured by us at Peterboro Ontario.

***

The raw stock was secured from our quarries in Alaska, Texas, New York and Vermont.

***

VERMONT MARBLE COMPANY

Peterboro, Ont. - Proctor, Vermont

JUDICIOUS BUYING

When an Engineer or Architect specifies "ALMETL" Firedoors, he may be sure his client is getting the best value and the best protection that money can buy.

"ALMETL" Firedoors are made of galvanized steel—the lasting metal—there are no wood cores "protected" by light terne or something similar. They will not sag, twist or warp and will withstand the most intense fire. Canadian built throughout.

Our Department "A" will gladly furnish drawings and details of the "ALMETL". A request on your letterhead will bring them.

Geo. W. Reed & Co., Limited
MONTREAL

Solignum

Wood Preservative—Shingle Stain—supplied in special grades for interior woodwork. Made by Major & Co., Limited, Hull, England.

PARIPAN

The finest enamel for plaster or wood; flat or gloss, in colors. Made by Paripan Limited, London, England.

FLINTEX

Concrete hardener—makes floors frost, dust and wear-proof. Made by us here.

STURGEONS

French Polish Wax—the best wax on the market for all purposes. Made by us here.

STURGEONS LIMITED BRITISH PAINT SPECIALTIES 64-66 RICHMOND STREET E., TORONTO

October, 1920 Volume XIII., No. 10

CONTENTS

INTER-ALLIED TOWN PLANNING AND HOUSING CONGRESS OF 1920.... 303
By W. D. Cromarty.

R.A.I.C. ASSEMBLY, OTTAWA 310

LABOR IN THE BUILDING INDUSTRY 312
An address by President J. P. Anglin of the Association of Canadian Building and Construction Industries before the R.A.I.C. Assembly.

PREMISES OF PRINCES' LIMITED, TORONTO 317

ADAMS FURNITURE COMPANY'S BUILDING, TORONTO 321

NEW HOBBERLIN BUILDING, TORONTO 323

POST WAR ARCHITECTURAL AND BUILDING PROBLEMS 324
An address by Charles H. Whittaker of the American Institute of Architects, before the R.A.I.C. Assembly.

O. A. A. NOTES 329

SYNOPSIS OF CAUCHON REPORT ON RAILWAY SITUATION IN LONDON, ONTARIO 333

EDITORIAL 335

Frontispiece

MINISTRY OF MUNITIONS' HOUSING SCHEME, WELL HALL, WOOLWICH, ENGLAND 302

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

"ROSS WAY," LOOKING EAST, 1915

MINISTRY OF MUNITIONS
HOUSING SCHEME.
WELL HALL,
WOOLWICH, ENGLAND.

CRESCENT, NEAR STATION.

"ARSENAL ROAD,"
LOOKING WEST, 1915.

"OLD OAK," LONDON COUNTY COUNCIL DEVELOPMENT.

Inter-Allied Housing and Town Planning Congress of 1920

By W. D. Cromarty.

Address delivered before the recent London Convention of the Ontario Association of Architects.

THE business of the Inter-Allied Housing and Town Planning Conference was divided into two parts, the formal proceedings and discussions and the series of visits made to various housing projects.

The formal proceedings were held in the Central Hall at Westminster almost under the shadow of Westminster Abbey on Thursday and Friday, June 3rd and 4th. In the week following the delegates made journeys in the neighborhood of London and as far afield as Bristol and Birmingham, visiting both pre-war and post-war housing schemes.

At the opening session some 700 delegates were in attendance, twenty nations being represented. France had 35 delegates, Norway 45, Holland 50, Finland 53, Belgium 25, Spain 20, Denmark 20, the United States 6. In addition, among others, the following countries had representatives—Canada, Australia, New Zealand, Cape Colony, Egypt, Italy, Switzerland, Roumania, Japan and Siam. Dr. Addison, the Minister of Health, presided, and after welcoming the delegates and outlining the business of the Conference, he stated that he thought it fortunate and indeed significant that one of the first international meetings after the conclusion of peace should be assembled to discuss housing.

Short addresses were also delivered by the delegates other than those of Great Britain, including the Spanish Ambassador, M. Merry del Val, a brother of Cardinal Merry del Val; M. Sellier, a French delegate; Mr. Thomas Adams, representing Canada; Mr. Veiller of the National Housing Association of the United States, and Dr. Royal Copland of New York.

The presiding officers of the subsequent sessions were in turn: the Minister of Health for France; Mr. Robert Munro, Secretary for Scotland; and Lord Astor, Under-Secretary of the Ministry of Health.

The conference, at the first session, passed a resolution to this effect:

> That, in the opinion of this Congress, legislative action in the preparation of a National Housing Policy should be taken by each Government (with wherever necessary special financial provisions relative thereto), such programme to be carried into effect on lines of co-operation between the Government on one hand and local authorities and other agencies—including private enterprise—on the other.

TYPE OF FACTORY: PLENTY OF LIGHT, PLENTY OF ROOM, GARDEN SURROUNDINGS. WORKERS LIVE FEW MINUTES WALK AWAY.

A BACK YARD THREE YEARS OLD: PAIR OF HOUSES, SOLLERSHOT, WEST

MEADOW WAY.

VIEWS OF LETCHWORTH.

LETCHWORTH: BACK GARDENS OF WORKMEN'S HOMES.

Further, this Congress is of opinion that such a housing policy should be sufficient in its scope and character to secure that within the limit of twenty years every family shall be housed under proper conditions with adequate provision for amenity in regard to surroundings.

At the afternoon session on Friday, the following resolution relating chiefly to town planning was passed:

(1) That in order to secure adequate provision of air and light in and around the homes of the people there should be definite limitation of the number of dwellings per hectare and for space adjacent to dwellings, such limitation being a matter of Governmental determination in each country.

(2) That the policy of decentralization of industries and the building of new garden cities should be encouraged by legislative provisions and by all other means, both public and private.

(3) That each Government, acting in partnership with local authorities, should prepare in advance and carry into effect a regional survey, followed by planning schemes, with a view to putting an end to wasteful and chaotic developments and securing that the lines of future growth shall be well ordered and scientific.

(4) That in view of the acknowledged necessity of such action the Government should, acting in co-operation with local authorities, control the direction and assist in the upkeep of main and arterial roads.

One of the great benefits of such a congress is the opportunities it affords of talking over problems and conditions with men from other lands. Such opportunities were many, occurring now and then in the corridors of the Central Hall at a time when some eloquent gentlemen pleaded in the meeting for his particular and generally impossible fad. Chiefly, however, the opportunities occurred during our visits around the country. I found men from France, Norway, Sweden and even as far afield as Egypt, who had visited Canada and who, retaining pleasant impressions, were anxious to know of what we were doing here. I told them modestly, I trust, of the things we had done and of what we hoped to accomplish.

On behalf of the British Government, Sir Alfred Mond, H.M. Commissioner of Works, invited the delegates to a garden party at Hampton Court on the afternoon of June 7th. The delegates were received by Dr. Addison, the Minister of Health. It was a wonderful June day of soft sunshine. The lawns and flowers and splashing fountains dominated by the grey old buildings with the vivid memories of kings and princes and cardinals made an impression I shall not soon forget.

On Thursday, June 10th, H.M. King George V. received a deputation from the Congress at Buckingham Palace. The deputation consisted of two delegates from each country represented. Mr. Thomas Adams and myself as Canadian representatives were included in the deputation and were presented to the King. I derived a certain amount of quiet amusement when on hailing a taxi, the driver asked me "where to." I murmured Buckingham Palace, managing, I think, to convey the impression that I lived there.

In connection with the Congress I paid visits

siderable number of housing schemes. I shall have to confine myself briefly to three of them, with some reference to the newer materials and types of construction being used at others. The three are Well Hall, Letchworth and Hampstead. At Well Hall, Sir Frank Baines, the chief architect of the office of works received the delegates. The Well Hall scheme was a direct outcome of the war; the town being built for the Ministry of Munitions in 1915. The whole of the work of building up an area of 96 acres with permanent houses, occupied less than a year from start to finish. There is, however, no suggestion of hurry or scamped labor anywhere, and the houses wear an air of comfortable prosperity, and the whole scheme is pleasant to look upon, although the design in general errs on the picturesque side. The open spaces are of considerable area with a reasonable allowance of garden space to each house, the average garden being about 1,100 square feet. All the roads are gravelled, the secondary sidewalks also are gravelled, the more frequented ones having concrete slabs down the centre. The roads are 40 feet and 30 feet wide according to the amount of traffic passing over them. The names of the roads recall personages who have been connected with the Arsenal and the town of Woolwich. The total number of houses and apartments provided is 1,298, thus making provision for a population of about 6,500.

LETCHWORTH: GARDEN CITY AGRICULTURAL BELT.

In certain of the houses the rooms were too small. I spoke to several of the tenants, two living in houses without parlors expressed a preference for an ordinary fireplace in the living room with the range in the scullery. This would constitute an arrangement similar to the small Canadian house with a living room and a modest kitchen. The bath-tub in some of the houses is in the scullery. This would seem to be fatal to cleanliness, as the cover over the bath-tub becomes a shelf, necessitating the removal of a large variety of articles prior to bathing. In most of the newer developments in England, the bath-tub is in a definite bathroom and is generally on the upper floor.

The absence of street trees is very noticeable, and mars the effect of the otherwise attractive streets.

The reason for this is, of course, that the work was undertaken at a time of great national stress when the lesser things had to be set aside. Trees will, I have no doubt, be planted later and the added charm resultant from their presence obtained.

"HAMPSTEAD WAY," HAMPSTEAD GARDEN SUBURB.

Letchworth. — This, the first Garden City, is situated about 30 miles from London, and owes its being to the Garden City Association which was formed to bring before the public the principles advocated by Mr. Ebenezer Howard. The garden city movement seeks to make us ashamed of our ugly, unhealthy cities, and to advance principles by which their worst evils may be abolished or at least reduced to a minimum in the planning of new cities. The English countryside is very

beautiful, but many of the larger cities are depressingly unlovely. Thoughtful town planning in years past would have obviated this. Letchworth is now a town of some 13,000 people with sixty factories and workshops, carrying on under conditions favorable to the health of the workpeople.

The general effect of Letchworth is one of much charm. In detail one is disappointed at the lack of interest displayed in the gardens of the smaller houses. This is no doubt accounted for by the fact that the occupants of these houses were previously dwellers in large cities where gardens for the worker were unknown. It is the next generation that will benefit most completely by their new environment.

I went carefully over the houses now being built at Letchworth. In spite of the vastly increased cost (pre-war £200, post-war approximately £1,000), they do not possess the charm of the earlier houses. A Spartanlike simplicity is now aimed at, and while one appreciates this as a general motive, there is no denying that the occasional introduction of gables and long roof lines, for example, does add to the appealing quality of a scheme.

The main principles of the garden city movement may be thus classified:

1. Constructive—by the erection of new houses in undeveloped areas.
2. Provision for both industries and residences.
3. To procure the unearned increment for the community.

As the official handbook of the First Garden City Company puts it: "The essence of the idea lies in the principle of beginning at the beginning. Instead of allowing houses to be run up here and there, one block or one street quite irrespective of the position of another, drainage and water system being introduced piecemeal, as best they can—the whole city which is to be should be planned out from the outset with an eye to the convenience of the community as a whole."

For good or ill the people of Great Britain are a manufacturing people, and the Garden City recognizes this economic fact as it also recognizes the prevailing tendency of manufacturing industries to migrate from large centres of population to rural districts—a tendency, by the way, that is prevalent in Canada at present.

Letchworth has been an undoubted success, 3,800 acres were bought at $200 an acre. The promoters planned the site of the city. They put in an electrical installation, gas works and a pure water supply. They prescribed that there should not be more than seven or eight houses to the acre. All the industries were put in one part of the estate where the prevailing winds would take the smoke away from the town. The worker in Letchworth lives within a few minutes' walk of his place of employment. No costly transportation system takes him to a point ten miles or so out in a suburb to a plant in the centre of the city requiring him to spend two or three hours a day in going to and fro from his work.

It was decided to maintain control of the land in perpetuity for the benefit of the people. The so-called unearned increment is conserved for the benefit of those who create it. The land, as I have said, was bought for $200 an acre, the value of it now has increased to $1,000 to $2,000 an acre, and the whole of that increase in value goes to the reduction of taxes or to the development of the estate and the provision of new public services. There can be no private property in Letchworth. Land can be acquired for 99 years with the right to renew at the end of that period subject to a revaluation. It has been found that this system gives the practical feeling of ownership, while the important power is reserved by the trustees of the community to prevent misuse of the land by incongruous and undesirable development. An interesting feature of the Garden City scheme is the agricultural belt around the city. The city area comprises about 1,200 acres laid out for a population of 30,000 people; 2,600 acres of the original area, with an additional 700 acres since acquired, are reserved as a permanent agricultural belt around the city. Here farming is carried on, and here, too, are areas reserved for golf, tennis and other outdoor games. Thus the inhabitants have a large open area all around the city that can never be built upon, and the produce of this agricultural area is brought close to the door of the consumer.

COTTAGE OF PISE DE TERRE, NEWLAND CORNER, SURREY.
CLOUGH WILLIAM-ELLIS, ARCHITECT.

The industry of farming is thus linked up with the manufacturing interests in one community avoiding the usual separation of town and country and the unsightly and ragged development on the fringe of the city which we have all so often deplored.

Hampstead is a garden suburb, not a garden city, the latter being complete in itself, while

the former is residential only. It owes its origin to the work of Mrs. Barnett, who is at present in Canada, and will lecture in Toronto. Mrs. Barnett is the wife of the late Canon Barnett and his co-worker for many years in the East-End of London. After a lifetime spent in the closest touch with the physical and spiritual needs of the people in the East-End of London, she saw in Mr. Ebenezer Howard's scheme an opportunity for the improvement of the deadly monotony of the average London suburb.

She conceived the idea of a garden village at Hampstead, near the famous heath, now as a result of her efforts an open space for ever. The estate was laid out by Mr. Raymond Unwin, and to-day it is a place of great beauty. Both rich and poor live there, barristers, architects, musicians, actors and poets. These, of course, are the poor. It is only a short ride on the underground from the centre of London, but here are pleasant gardens and open spaces with great trees, every house well designed, and congenial men and women living there. There are few places on this wide globe where a person of modest means could be so content as in Hampstead.

Of post-war housing in England much has been said and written, and perhaps more has been accomplished than many critics are willing to concede. In proportion to the vast number of houses required, 800,000, according to a statement issued by the Ministry of Health, the number of houses actually built is astonishingly small. Plans, however, have been approved of some 250,000 houses, and contracts for the erection of about 75,000 houses have been entered into. The scarcity of suitable labor and materials is the root cause of the lack of greater accomplishment, but this will be remedied by a nation which generally triumphs in the end.

The state permits a local authority to borrow money and institute taxation for housing purposes, expenditure in excess of a certain amount is met by the state. In addition the state meets a proportion of the interest on the capital borrowed. The local authority is bound to build houses, if it does not the state steps in and builds them and charges the cost to the local authority.

I mentioned previously the fact that the state will present to the builder or private person erecting a house or houses the sum of $1,300 per house. This is a gift, not a loan, and is intended to assist in meeting the extremely high cost of building.

The shortage of bricks in England has caused attention to other materials, notably concrete, steel, wood and pise de terre or earth for house building, and I visited schemes where each of these materials was being used.

There are many advantages claimed for concrete in this connection; for example, cheapness where suitable aggregate is locally obtainable, speed in erection and ease of manufacture. In-so-far as cost is concerned, it is unlikely that under normal conditions concrete would prove much cheaper than brick. The clay for brick-making and the aggregates for concrete are both raw materials generally obtainable at a low cost. The excessive demand for bricks, however, and their comparative scarcity probably makes concrete a cheaper material to use.

There are, roughly speaking, two systems of concrete construction in use, the pre-cast and the site moulded. Of the pre-cast system concrete blocks and slabs have found most favor, their use makes a continuous cavity possible. This, it is claimed, eliminates the possibility of dampness on the inside walls and assures coolness in summer and warmth in winter.

The entirely site moulded construction has not proved very popular; it is stated that houses built in this way are cold, that the walls "sweat" on the inside and are liable to crack. Possibly if such walls were strapped on the inside prior to plastering, some of these objections might be overcome, but this is obviously an added expense. In addition, for this type of wall, forms are necessary; these are not needed for concrete blocks.

One objection to the use of concrete is the hard appearance of the exterior walls. They do not "weather" as brick and stone walls do. The charm of the old cottages built of the two latter materials lies to a considerable extent in the mellowing caused by sun and rain and wind. Concrete does not appear to mellow in the same way; the application of stucco, however, assures an attractive appearance.

Among the many large schemes carried out in concrete blocks is the village of Chepstow, erected for the employees of the National shipyard. The external walls of these houses are built of two thicknesses of four-inch solid plain concrete blocks with a three-inch cavity, tied together with iron ties. In the first cottages built the blocks were each 32 inches long, 9 inches high, and four inches on bed. It was found that these blocks were too heavy for handling, and in the later houses the blocks were made 16 inches long. The concrete blocks were made on the site of local stone chippings and sand, and these blocks could be used a few days after making.

Houses have also been built of reinforced concrete. These houses, it is stated by the builders, cost considerably less than brick houses of the same size; they are rapidly constructed, an experimental pair being completed four weeks after the start of operations.

The steel frame system of house construction was introduced by Messrs. Dorman, Long & Co. at their industrial village, Dormanstown, Redcar, Yorkshire. Dorman, Long & Co. is one of

the largest firms of steel manufacturers in England, their main works being at Middlesborough. During the war new works were opened at Redcar, and in order to house their employees a new village was planned near the works. The first 300 houses of this village were built during the war and were of brick.

When the company desired to extend the village, they decided to adopt a method of construction unique in house building, a framework of steel for the outside walls, upper floors and roofs, with hyrib as the concrete reinforcement.

The site of each house is first laid with a thick bed of concrete on which steel sills are laid and secured by Lewis bolts. The builders then proceed to erect the steel frame which consists of light rolled sections all made to precise standards and clearly marked before being sent to the site. The connections are made by bolts and nuts, no riveting being required. The erection of the frame in consequence takes but little time.

To this steel framework is attached the expanded metallic material, which is then concreted to a thickness of two inches; this forms the outer shell. The exterior may be finished in stucco or simply whitewashed. An inner wall or shell is formed of cinder concrete slabs three inches thick with an air space of about four inches between the inner and outer coverings. The interior partition walls are also built of cinder concrete slabs.

For the floors the reinforcing sheets are fixed to the steel joists by means of plate clips. The concrete is then applied to a thickness of two and a half inches with a smooth composition finish and with a half-inch coat on the underside to form the ceiling.

The roofs are of tile or slate laid on a similar reinforcing material. It is claimed that these houses are absolutely water-tight, the outer skin of reinforced concrete offering great resistance to the severest weather. It is further claimed that they are by virtue of the continuous air space cool in summer and warm in winter. The builders state that the cost is less than one of equal accommodation in brick, and that these houses can be much more rapidly built.

This type of house, if it could be built for a reasonable amount, would probably be quite suitable for Canada. Concrete floors with a composition finish might not prove popular here. Hardwood floors or stout linoleum could be laid on the concrete, but this of course would add to the cost.

The frame house is a traditional English method of building. It is probably true that the general use of wood for building is superseded by the use of more permanent materials as our resources increase. The tendency in the larger towns in Canada and the United States has been of late towards brick, stone and concrete, and it is unlikely that under normal conditions the building of frame houses would have been seriously considered in England. The war, however, and the consequent shortage of houses, has introduced an entirely new condition there —a pioneer condition—when a house that may be speedily erected is the need of the hour, and it is here the frame house may help.

Sir Charles Ruthen, an English architect, has built as an experiment three frame cottages at Newton, near Swansea, and in a paper read before the Society of Architects in London on October 16th last, he gave an account of their construction. Sir Charles said that these houses complied with all the essentials necessary for the provision of homes for the people and were cheaper than brick or stone houses and had the added advantage of rapidity of construction.

The first house of frame and stucco was erected and completed in thirty days; the second is a brick veneer type, and the third brick veneer and half timber work.

The type of construction adopted is the same as that in general use in Canada, the roofs, however, are of slate or tile instead of shingles.

The site at Newton was selected for the houses because of its exposed character. It is some two or three hundred feet above the Bristol Channel and fully exposed to the prevailing westerly gales. On visiting the houses one feels regretful that they are not more readily accessible; had they been built, for example, in the near neighborhood of London, so many more people would have had an opportunity to see them, and these houses would surely have conquered an island prejudice against the lately unknown and untried thing.

Sir Charles stated that the actual cost of the stucco finished house was £125 less than it would have cost in brick.

Mr. Clough Williams-Ellis, an English architect, has recently built on the estate of Mr. Strachey, the editor of the "Spectator," in the south of England, a small house of pise de terre or rammed earth which has attracted a good deal of attention. Buildings of this material are not new. They have been erected in France and Spain, and more recently in India and Rhodesia. The material, however, is new for all practical purposes so far as England is concerned.

Pise is merely earth to which nothing whatever is added. The earth is dug and thrown between wooden forms and rammed till it is perfectly hard and compact—until, in fact, what is practically an artificial sandstone has been created. The earth is thrown into these forms in layers of five inches or six inches, and then rammed until it is thoroughly solid, before another layer is added. When the mould is full of rammed earth, and the rammer no longer makes

(*Concluded on page* 328)

David R. Brown

Newly elected President of the Royal Architectural Institute of Canada.

R. A. I. C. Assembly, Ottawa

THE thirteenth general annual assembly of the Royal Architectural Institute of Canada was held at the Chateau Laurier, Ottawa, on October 1 and 2, with President A. Frank Wickson in the chair.

The meeting was opened with an address by Mayor Fisher of Ottawa, who extended a warm welcome to the visiting architects. In the course of his remarks, his Worship stated that perhaps the present period was not altogether one of unmitigated evil, that from it would likely emerge a return to first principles which would, among other things, exert a stimulating influence toward the development of a national architecture.

In responding to the address, President Wickson declared that as the knowledge of architecture increased the public would become more impressed with the fact that well designed buildings were not only a practical necessity, but an important factor in their everyday lives. Canada's building expenditure at the present time amounted to approximately $85,000,000 annually. As this represented developments which were carried out to endure a long time, it was an important matter that these structures should be so designed and constructed as to be a credit to the country.

Following the adoption of the minutes of the previous annual assembly, the report of the Hon. Secretary was presented. This report dealt largely with matters which came before the meeting of the Council at Montreal on July 10th, of which a complete digest appeared in the August issue of Construction.

The secretary reported that at the suggestion of the Royal Institute of British Architects, the Council is giving close attention to the action which is being brought by Messrs. Saxe and Archibald and other competitors against the Government in reference to the Ottawa Government Building Competitions. The R.I.B.A. is retaining the services of counsel to follow the case, and an appeal has been made to the provincial associations for financial assistance to help establish the rights of the competitors.

The attention of the meeting was also drawn to the conditions governing the competition for the St. John, N.B., courthouse, in which connection the Engineering Institute was criticized for usurping the functions of the architectural profession. It was stated that the Engineering Institute dealt with the entire project without any reference to the architects and that the conditions were not eminently satisfactory. The meeting decided to have the incoming Council give its prompt attention to the matter.

Reference was also made to the decision of the Council to have special or urgent matters dealt with by a special committee to be appointed by the general annual assembly. Heretofore, in cases demanding immediate action, it was found that nothing could be done owing to the fact that no meeting of the Council could be held until after thirty days' notice. The intention is to have the committee take prompt action between Council meetings on all such matters as the president may deem to be of an urgent nature.

The president stated that upon the request of Queen's University, a lecture was delivered at that school by a representative of the Institute. It was felt that much more could be done in this direction, and that practically every seat of learning would be glad to have some one talk to them on the subject of architecture.

The president further suggested that effective educational work could be done providing funds were available, and that arrangements might possibly be made with the film companies to show examples of good architecture, particularly worthy instances of good design of buildings erected in Canada.

An important subject up for discussion was the necessity of additional revenue to carry on the work which the Institute was doing. This was based on a recommendation of the Hon. Treasurer in presenting the financial statement for the year, and resulted in the adoption of a resolution to increase the membership fee to a sum not to exceed $5.00 annually. It was the general opinion that the present fee was altogether too inadequate for the important work and objects which the Institute was endeavoring to further.

Attention was also drawn in this connection to a resolution passed at the recent convention of the Ontario Association at London, asking the executive of that body to co-operate with the other provincial associations with regard to reinforcing the activities of the Institute and also with a view to co-relating the activities of the different associations, so that the work of the Institute might really be of a national character.

The hon. treasurer reported that as a result of representation made to the Board of Customs Duty, the tariff on imported plans has been increased from 1 to 2 per cent., and that an effort was being made to have a duty levied against specifications as well.

On motion of the hon. secretary, the Council was instructed to deal with certain proposed revisions to the by-laws in reference to special committee work, collection of fees, nomination of delegates, travelling expenses of Council

members, and the fixing of the pro rata rate.

It was further decided to have the Council communicate with the provincial associations with a view to publishing a year book to comprise their several charters, by-laws and other regulations, and a list of the profession in the different provinces.

Prominent speakers addressed both the luncheons and the business meetings. Mr. Eric Brown, of Ottawa, gave a fine talk on "Canadian Art and the Canadian National Art Gallery."

Professor Percy E. Nobbs gave an outline of what has been accomplished by the Government as regards "Battlefield Memorials," and the probable conditions which will govern the proposed competition to select designs for the monuments to be erected.

Other interesting addresses were delivered by Mr. Charles H. Whittaker of the American Institute of Architects and President Anglin of the Association of Canadian Building and Construction Industries, who spoke on the labor situation and present conditions affecting the building industry. The subject matter of these addresses dealt exhaustively with problems of vital interest to the profession, and resulted after considerable discussion in the adoption of a resolution requesting the Council to arrange if possible with the provincial associations for monthly meetings in each city where local chapters are established, to which architects, engineers, contractors and representatives of the Trades Council would be invited to discuss questions affecting their mutual interests.

At the closing luncheon, Dr. C. A. Hodgetts of the Department of Public Health, and formerly Red Cross Commissioner at London, gave an interesting and instructive address in which he paid tribute to the services rendered by the architects to the Army Medical Service during the war. Dr. Hodgetts spoke of the power combined in the medical and architectural professions to make or mar human happiness. The subect was altogether an important one, and will be dealt with more fully in the next issue of Construction.

It was decided to hold the next general assembly at Winnipeg at a date to be fixed by the Council.

ELECTION OF OFFICERS.

The election of officers for the ensuing year resulted as follows: President, David R. Brown, Montreal; vice-presidents, W. D. Cromarty, Ottawa, and L. H. Jordon, Winnipeg; honorary secretary, Alcide Chausse, Montreal; honorary treasurer, C. S. Cobb, Toronto. Council: John S. Archibald, Montreal; J. P. Ouellet, Quebec; Joseph Perrault, Montreal; C. H. Acton Bond, Toronto; A. Frank Wickson, Toronto; Herbert E. Moore, Toronto; John M. Watt, London; A. G. Wilson, Edmonton; S. M. Eveleigh, Vancouver; A. S. Mercer, Vancouver; David Webster, Regina; W. C. Van Egmond, Regina; M. W. Sharron, Edmonton; A. Melville, Winnipeg; R. B. Pratt, Winnipeg.

Labor in the Building Industry*

By J. P. Anglin.

President of the Association of Canadian Building and Construction Industries.

THERE can be no industry of such vital interest to mankind in general as building construction. It matters not where man dwells or where he works, he must come in direct contact with actual building "labor" at some stage of his activities.

Of the three great necessities of life, food, shelter and clothing, the first and third come to us for the most part through salesmen. We seldom even see the "labor" which produces these. Building, however, goes on in full view, not only of its owner, but of the public as well. Then, too, who is ever free, even for a twelvemonth, from the presence of a representative of the building construction industry within the very four walls of his private dwelling? A broken pane, a split pipe, a cantankerous door, damaged woodwork, or some other of the hundred and one things necessary to keep our immovable property habitable demands the actual presence of the building mechanic.

If, then, the individual householder is vitally interested, how much more should the architect, the engineer, the contractor and the worker unite to study the labor problems of their common industry, and combine to raise its standards. . . . Both our organizations are the representative bodies in their line of endeavor, and should be definitely linked up to raise standards all through this great industry. The Architectural Institute needs every architect's support, and ours the co-operation of every contractor, as well as every supplier and producer of building materials. . . . Broadly speaking, all our problems have a direct or indirect bearing on the labor situation in our industry.

Let us briefly run over a little history, because a proper study of the past should be of material aid in developing out of the present difficult conditions something even better than

* Address delivered at the Thirteenth General Annual Assembly of the Royal Architectural Institute of Canada, recently held at Ottawa.

has been. We cannot hope to do this in a day. It will take a generation or two, but we must begin, or building will degenerate into a purely mechanical or machine-made conglomeration of steel and stone.

We cannot dwell at length on ancient labor in the building construction industry, but we should recall those times of which we have all read, when the mechanic, architect, and builder were one and the same individual in most cases and where he was surrounded by a few whose ideals were of the highest, and who in turn were aided by a mass of common labor. Such was probably the case in the best Egyptian and Grecian work. Coming to Roman work there began to appear a more distinct division of duties, the builder more separated from the architect, and soon the desire for an estimate and fixed price cursed the community and the contractor was evolved.

As the present is an age of organization—perhaps too much so—we must consider the organization of guilds, which played such an important part on the continent in the middle ages. These guilds frequently had their origin in a desire to combat the power of the nobles. They became so powerful about the thirteenth and fourteenth centuries that in some cases they formed the basis of municipal government, and in order to participate in local affairs, a citizen had to become a member. (Surely this was the closed shop in the extreme). They even acquired the right to bear arms for their defence, and later the guilds were even victorious over the nobility and their power continued for several centuries. Only in the eighteenth century several edicts were issued in Germany, permitting all to practice any trade without having guild membership, and the same was done in Austria in 1860.

In England, these mechanics' societies began with the development of cities. They had no legal right to prevent any man from practicing his trade; the only restriction was Elizabethan, and required seven years' apprenticeship. It is noteworthy that the only English guilds of importance still in existence are those whose chief object is to give relief to poor and needy members.

In France, guild privileges were sold by the State, until the Revolution at the close of the eighteenth century, when every restriction to practice any trade was removed. It was during the first half of the nineteenth century that similar action was taken in the other European countries.

Unionism, or the modern trades and labor union, as we have it to-day, has developed to its present high state of organization during the past fifty years, and is the direct outcome of the modern system of industrialism, whereby factories, mines and general business is formed into large corporations, and in place of the old struggle between guilds and nobles, we now have labor unions versus capitalization.

The building trades, even before the formation of large contracting companies, were unionized. The fact that the work is so open and accessible makes it vulnerable, and the added fact that the workman is so frequently changing from one employer to another makes it difficult to develop or maintain any degree of mutual interest between the individual tradesman or mechanic and his employer. The formation of large companies also makes this individual contact more difficult, and, therefore, new means must be found for raising and maintaining the standards of workmanship in the various building trades.

In Canada we have been in the habit of depending on immigration to maintain our supply of building trade mechanics, while little attempt has been made to train the boys, and they are allowed to drift into other lines. We must begin at once a broad and comprehensive plan of apprenticeship and technical training, if we hope ever to improve the situation.

Apprentices were fairly common in most trades twenty years ago or more, but the rapid development of this new country held too great inducements in other lines than building. This situation was further aggravated by the war conditions, when even a boy could earn a man's wages in munition factories.

Another war condition was the rapid assimilation into munition work of the major portion of building labor. Steamfitters, carpenters, stone-cutters and masons, being trained men, soon learned the new game, and as building was slack and munition pay high, they did well. This affected the building labor by reducing the quality and efficiency of thousands of our mechanics in the building trades.

Still a further war condition was the scarcity of good tradesmen left for even the much reduced volume of work. This condition, and the wage competition of various localities and of other industries led to the actual bidding for "building labor." Even without the influence of trade unions, wages would have been greatly increased, but the union, taking advantage of this condition, forced greater increases in some trades than others.

At the close of the war we expected much unemployment for a lengthy period, and plans were made to boost construction to avoid excessive unemployment and to catch up with the building shortage. Our governments planned considerable work as well, but this was scarcely needed. While very little Government work was started, there has never been lack of employment, and even now, two years after the armistice, building labor is scarce in all trades.

As to *production* and *quality*, it is said that

costs are high and work inferior. As to inferiority, can we not see that it is due chiefly to scarcity of good materials and the necessity to permit lower grades, and so poorer work results? No doubt a great deal of the inferior building is also caused by the fact that high prices tend to influence the owner to buy lower quality materials in order to economize.

Regarding *output,* I can say from experience, and after comparing pre-war with post-war unit labor costs, that the output or unit of production in most trades shows little change. Speaking generally, wages have increased seventy-five per cent. and costs about one hundred per cent. Curiously enough, such trades as bricklaying, painting, and even common labor, where wages increased about one hundred per cent., do not show as high an increase in unit labor costs as carpenter work and plastering and steamfitting, where the wage increase was less.

Production, however, is now greater than it was during 1919. It is still, nevertheless, far below what is possible. The old saying "an honest day's work for an honest day's pay" still holds good, I believe. But who is to determine the "honest day's work"—the workman? And who is to settle the "honest day's pay"—the employer? So long as we stand apart and wrangle at long range, just so long will dissatisfaction continue and low output and inefficient work continue.

The only way we can improve matters is to get together and study one another's difficulties and problems, and arrive at an understanding.

It is said by some that the proper way is to wait for hard times and poor conditions to come, and then, perhaps, we'll have the upper hand and demand lower wages, longer hours and big output. The man who uses this argument is going along as our forefathers did a generation ago. He is reckoning without his host—organized labor.

This is the age of centralized control, and the great unions have been learning the game until they have developed the largest and most powerful machine-controlled organization in the world. The outstanding proof of this is the manner in which they forced their way into the Peace Negotiations, and even had labor clauses written into the Treaty itself.

In my humble opinion, this was labor's crowning victory, and unless great caution and care are exercised by its leaders, it will steadily decline as a world factor. If labor unions as a class attempt to dominate all other classes, by forcing "unfair demands" and "unfair conditions" by means of the undemocratic "closed shop" principle, instead of following the lines of real service to its members and the community, they will go the way of the old guilds.

The "closed shop" principle is not only undemocratic, but it is as inimical to the true and permanent success of labor as it was in the middle ages the cause of the ultimate failure of the guilds. The first plank enunciated in the trade union platform, viz., "the abolition of all forms of involuntary servitude," is contrary to the principle of forcing a worker to join a union before he can earn a livelihood.

Please do not misunderstand me. I am not opposing organized labor. I believe in organization, but not in over-organization, or in the abuse of organized power. The moment an organization departs from the high ideal of service both to its members and to the community, its usefulness is impaired. You perhaps recall the cartoon which portrayed "Giant Capital" standing ready to battle with "Giant Labor," but before the struggle they both looked up and beheld across the narrow river a third who was called the "Great Unorganized Majority." This third giant was many times larger, and stood gazing on them with interest. There could be no serious fight in his presence if he stood up for his rights.

Turning to the consideration of the question of building labor, what are its present problems and future needs? There is no doubt in the minds of most sane men that this is an age of organization, rather than a period of individualism, and further there is no doubt but that the only way to meet organization is with organization. We must first, last and always aim to render the service that will demand the respect, support and aid of all engaged in our branch of the industry, whether it be labor, business, or professional. The man who will not get under his special organization should be looked down upon as one who derives a benefit without paying his way. Individuals who "ride free" should not be tolerated. . . .

At the great National Industrial Conference in Ottawa, about a year ago, there were nearly a hundred delegates representing labor, whose whole time is paid for by labor organizations. Millions upon millions of dollars are contributed by our employees to carry on their unionizing work. Is it not high time that we gave without stint to our societies and associations, so that they can employ the staff, and be prepared to co-operate in the great service-rendering campaign? If we fail in this we shall fail utterly to solve present problems or meet future needs.

Having strong organizations we can then function adequately, and at least try to solve our problems, and anticipate our future needs As an illustration, let me cite the case of our "National Joint Conference Board" in the building and construction industries. At present it is composed of five representatives from our Canadian Association and five from labor in our industry. There is an independent chairman. Why should not the Royal Architectural

Institute of Canada and the Engineering Institute also be represented?

The aims and objects of this Joint Conference Board are set forth as follows:

(a) The functions of the National Joint Conference Board shall be of an educational and advisory nature, furnishing a common meeting ground for the discussion of questions affecting employers and workmen in the building and construction industry of Canada.

The National Joint Conference Board shall remain in this advisory and educational form for an indefinite period, but it may exercise such powers as may be granted to it from time to time by the affiliated memberships.

(b) The National Joint Conference Board shall undertake to present to the Government such measures as may be requested by both groups, parties to the Board.

(c) The National Joint Conference Board shall advise with the organizations affiliated with it on measures which are considered to be of value in improving the building and construction industry, such as technical education, apprenticeship system, movement of labor, etc.

(d) The National Joint Conference Board shall encourage the organization of the employers and workmen in the groups represented by this Board into Local Joint Industrial Boards, for the settlement of disputes in the building and construction industry of Canada.

(e) The National Joint Conference Board may deal with disputes referred to it for settlement by affiliated organizations or established Local Joint Industrial Boards, provided they have been submitted in writing to the Chairman-Secretary and in his judgment are of sufficient importance to be brought to the attention of the Board.

Let me also enumerate some of the subjects we have already had under discussion, and plans for future action now in course of preparation: (1) Consideration of Causes of the Cement and Coal Shortage; (2) Proposal to Institute a Standard of Practice for Local Joint Industrial Boards, based on the experience of those now in operation; (3) Improved conditions which may result from the more scientific movement of Labor, to avoid seasonal unemployment; (4) Standard Apprenticeship Agreements, and the Training of Apprentices; (5) Wage Agreements, and their Effects; and (6) the Housing Shortage in Canada and its possible remedy.

Is it not evident that by adopting definite prescribed lines of action jointly with labor in our industry, we have taken a long step forward? Suppose we are able to agree upon a Canadian apprenticeship contract, establish attractive wages for boys, and add a system of technical training for them in the various building trades, do you not believe we will have more apprentices and better mechanics a few years hence?

We also believe we can formulate plans for the stabilizing of wages and the transportation of men from points of unemployment to points of employment. If necessary, we can together encourage the immigration of good mechanics in some trades where we are continuously short, such as bricklaying.

The architects can suggest some work for this National Joint Conference Board in the Building Construction Industry, and if it functions properly, much good for the industry and the community can be accomplished.

Some improvement which might be worked out through all Canadian-wide organizations cooperating with labor within our industry are:

(1) The unification and standardizing of building by-laws for various types of cities and towns.

(2) The standardization of building units for various types of cities and towns.

(3) The standardization of all building units and equipment.

(4) The equalizing of architects' and builders' responsibility in the provincial codes.

(5) The publication of standard practices in modern building construction.

(6) Town planning and zoning needs attention everywhere. Should we not lead in this necessary work?

(7) Housing could also be solved by such a Joint Board, if it is possible for anybody to solve the problem.

In so far as the immediate future is concerned, I believe the architect and the contractor can do considerably more to serve their clients and themselves by studying ways and means of reducing labor costs than is generally appreciated. A joint board should be created for this purpose.

At random, I would submit that labor costs could be lowered if the architect would more carefully apply the following suggestions:

(1) Eliminate multi-materialed building designs, as far as possible.

(2) Design buildings with minimum quantity as well as minimum variety of material.

(3) Localize to the limit, in the selection of materials.

(4) Anticipate by several months, information and details for the progress of your work.

(5) Consult master builders, even when design is in embryo.

(6) Specify briefly, but clearly and completely.

(7) Give decisions without delay.

(8) Allow rational time for building at normal speed.

These points will all tend to greatly reduce labor costs. So many architects and engineers fail to appreciate the extreme difficulties of present-day building, owing to shortage of materials, slowness of delivery, and the carelessness of the average individual.

Again, I would suggest that the contractor can do just as much on his side. I would like to see him make a serious effort along the following lines:

(1) Careful planning and routing of materials and sequence of work by looking well ahead.

(2) To study the work in hand so as to eliminate surplus labor.

(3) By taking a greater personal interest, either directly or indirectly in his workers, and to show them his costs and output.

(4) Having an up-to-date plant, and keeping it up.

(5) Careful handling of materials, and the avoidance of waste.

(6) The more careful selection of men, and the training of apprentices.

(7) Seeing that when a piece of work is done, it is done right, so that no come-back is possible.

Now about the client—can he help reduce his own cost? Both architect and contractor and even building workmen could help him with suggestions:

(1) By being fairly sure of what he wants, and of his requirements, and thereby avoiding as much as possible subsequent changes.

(2) By giving ample time for drawing and specifying and also for quantities and pricing.

(3) By beginning far enough ahead to avoid over-rushing and overtime.

(4) By prompt payment of both contractor and architect, thus ensuring efficient attention.

(5) By being rational in his time requirements. As a rule an under-manned building will cost less than one that is over-manned. (This one thing—the demand by the owner that operations must proceed in spite of conditions, is responsible for more raising of wages and costs than any other one factor).

(6) By getting back to the fixed contract system of building.

Coming to the consideration of labor, what is the course open for our building mechanic and workman? We can all make suggestions, but how can we get back the respect and good-will of our men? The men, who when all is said and done perform all of the manual labor, and to whose technical skill we owe the actual execution of the architect's design and the contractors' orders.

You may say, "Let him get busy and give us the day's work we used to get in years gone by." We know, and our clients know, and the worker knows that the average output per hour has been going lower year by year until we touched the fifty per cent. efficiency mark. This was reached in 1919, when some false prophet started to proclaim the gospel of "cut your output and so help to provide employment for all." This was when unemployment on a large scale seemed to stare us in the face.

No one thing has done so much to injure our industrial life during the period of unrest as this kind of false economic teaching. Its effect was immediately to increase costs, reduce buying power and, therefore, demand dropped, and there is really less work for all as a result. It is a simple truth that increased individual output reduces costs, increases buying power, and so creates employment.

What is needed chiefly is enlightenment on these questions. The workman, especially in our industry, is a highly intelligent being, but we are not appealing as we should to his sense of reason and perception, in a way to gain his respect.

There are already signs of improvement. The unrest is abating, and efficiency is gradually coming up. But, it is a voluntary improvement, as it should be, of course, and will only become permanent if we meet our workmen half way. They must feel the personal interest of the architect, the contractor and the owner. We can do this best on the works, but also indirectly. We should be ready at all times to confer on questions of mutual interest, and before long we would restore the confidence which we seem to have lost.

On their side, the building mechanics should help the employer by co-operating to the extent of encouraging their sons and others to become apprenticed, and further by aiding the beginner in every way possible to become a proficient mechanic. Is it not far better to teach our own boys rather than to go on depending on immigration? It is surely better to try to grow Canadians than to try to assimilate foreigners.

By being more frank all around in our dealings with labor, so that our men see the true situation, I feel satisfied that output will increase, and building costs recede, even without a reduction of wages.

Therefore, I would urge upon all engaged in the great building construction industry, whether architect, engineer, contractor, manufacturer, or workman, that we strive to get together and break the sod on common ground. Let us, for the sake of rendering that service for which the community is longing, begin without further delay to lay a foundation worthy of our noblest ideals, in the hope that we, or perhaps others who follow after, may erect a solid superstructure in the near future which shall represent the most efficient type of joint workmanship.

Let us remember that we are producing one of the world's fundamental necessities, shelter. We have assumed that trust, and from present indications we are making a failure of it. We are certainly falling far short of what it ought to be possible to attain. The terrible post-war world diseases of sloth, carelessness, materialism, and self-interest, still have us in their grip. We must shake them off, and by careful application and co-operative service lead in the upward struggle.

Steel Tubes for Reinforced Concrete

The increasing use of reinforced concrete for buildings of every description makes the question of the behavior of such structures in case of fire exceedingly important. Owing to the tendency of the steel supports to become overheated, there is a risk of the structure collapsing when exposed to fire. In order to obviate this danger a British engineer suggests that steel tubes might be used in place of steel rods and arrangements made to circulate water automatically through the tubes in case of fire. He considers that the cost of such an arrangement would not be excessive, and that it would serve to save the structure from collapse.

Premises of Princes Limited, Toronto

IN the premises of Prince's, Limited, the problem of the architects was that of remodelling the old Fairweather building at 84 Yonge street into an up-to-date catering establishment. It is therefore not a new structure, but one which has been so extensively altered as to be entirely new in character. In adapting the building to its present requirements, a complete rearrangement of the interior was necessary. The original structure had a series of large columns down the centre of the front portion. This objectional feature was removed by spanning the entire width with large steel beams supported by steel columns in the walls.

Moreover, the old store front was removed, as were also the steel columns supporting the front wall. New steel beams were set in position and encased with cut stone forming octagonal columns with carved caps. Above the ground floor the facade has been remodelled and finished with a cement plaster, giving a pleasing effect.

The feature of the scheme lies chiefly in the treatment of the interior, which is rich in coloring and decorative effects. On the main floor, as one enters, are the confectionery and French and Danish pastry sections, including an elaborate soda fountain, and immediately back of this are tables and chairs with accommodation for 500, where light luncheons and refreshments are served. The character of the ornament is Pompeian, and the color scheme in gold, black and bright red. In harmony with this is a terrano floor with gold colored ground, inset with

PREMISES OF PRINCES LIMITED, TORONTO.

UPPER VIEW: MAIN DINING ROOM. LOWER VIEW: GROUND FLOOR SECTION.

PREMISES OF PRINCES LIMITED, TORONTO.

DENISON & STEPHENSON, ARCHITECTS.

black squares at regular intervals. The walls are treated entirely as a background, only the pilasters standing out in relief. The ornament is rich and dignified in character, but is by no means overdone.

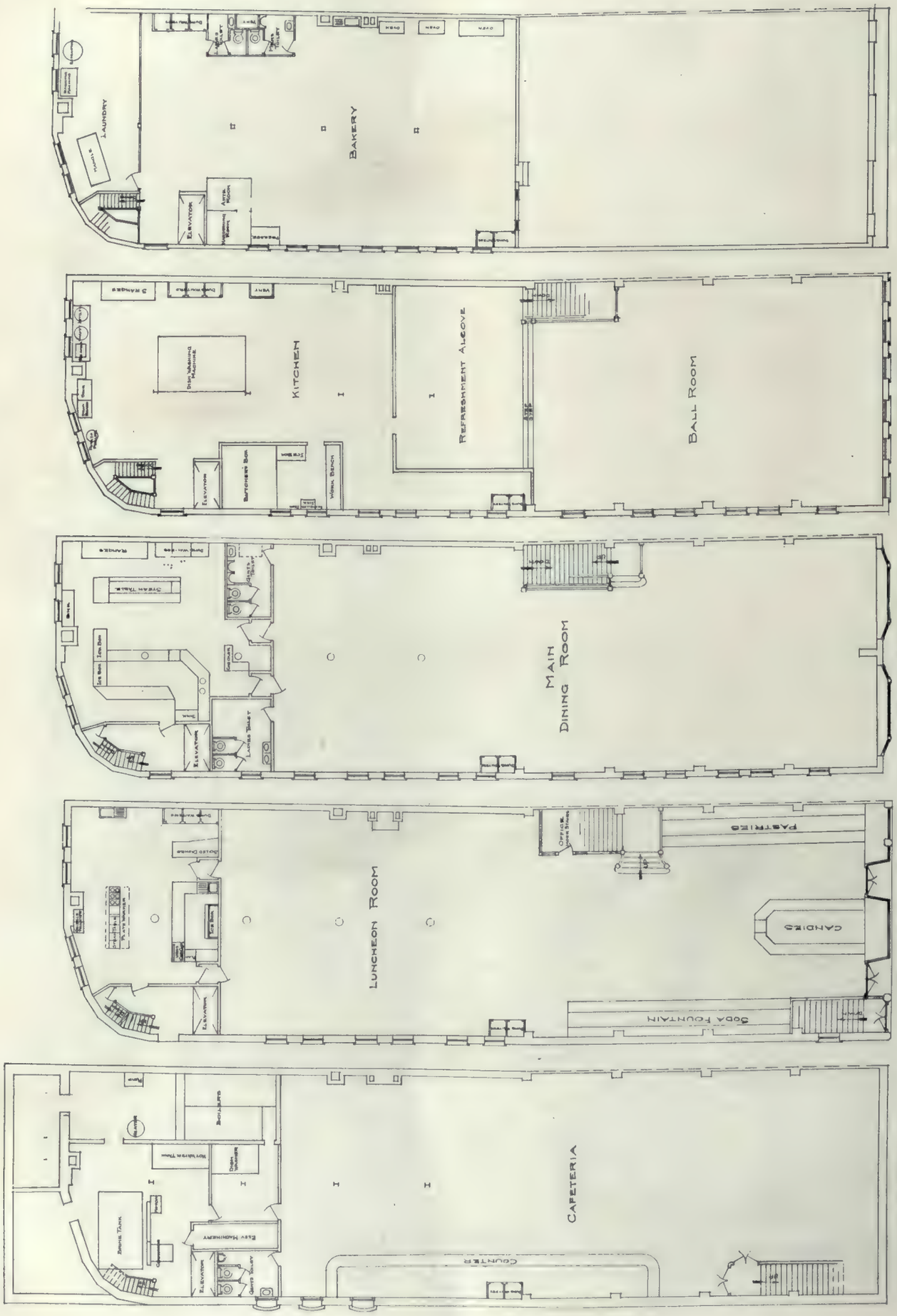
The building is 150 x 43 feet, three storeys and basement with an additional storey to the rear portion, and is used entirely for the business of the owners. Besides the ground floor accommodations, the plan divides itself into a basement cafeteria, main dining room and ballroom. The latter two are reached by a wide and well-proportioned staircase, under which the manager's office is located. The main dining room is approximately 110 x 41 feet, with separate lavatory accommodations, and direct kitchen service at the rear. The scheme is Adam in character and exceedingly rich in design. The ornament has been handled with great skill to conform with the architectural lines and is beautifully modelled and pleasing in detail. The ceiling and walls are in ivory and the element of color chiefly supplied by the draperies and carpets, the whole resulting in a most charming and inviting effect.

The ballroom is located at the front portion of the third floor, and is shown by plan only. The treatment here is quite simple, the wall being carried out as a background, and depending on the dresses of the patrons for color. The ceiling is in gold and black, and the lighting fixtures the main feature. A dancing space, 42 x 64 feet, is provided with an adjoining alcove where refreshments may be served. Italian draperies in black and gold with nicely balanced lambrequins of pleasing design are used on the windows and stand out in pleasing relief against the walls.

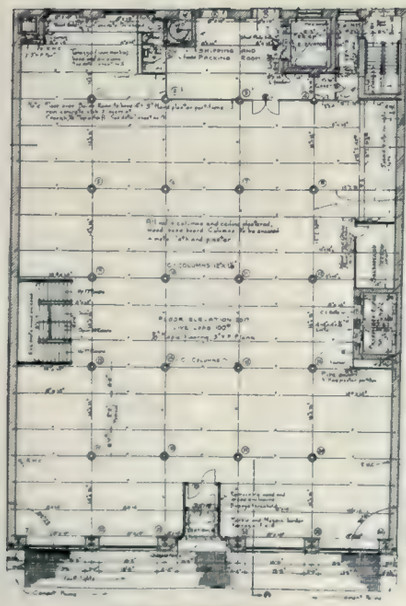
The basement has a separate street entrance, and is devoted entirely to the cafeteria. In order to gain more height, the basement was excavated three feet below its original level. The walls are finished in cement to imitate stone; the floor is of concrete in tile pattern and colored red, and the ceiling finished with ornamental plaster beams.

The fourth floor extending over the rear portion is used entirely for manufacturing purposes, and is equipped with modern facilities for carrying on a high-class baking and confectionery business, thus making the place a most complete and self-contained establishment, the pastries and candies being conveyed to the ground floor counters by electric dumb waiters.

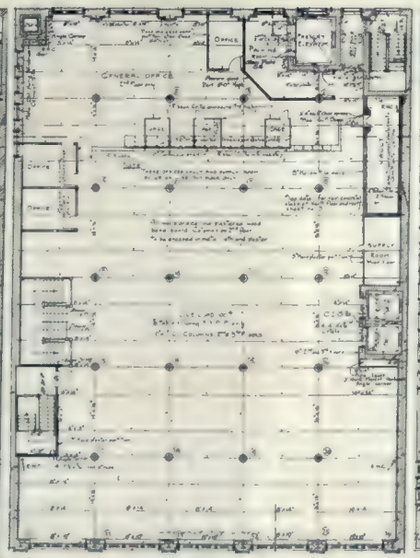
BASEMENT CAFETERIA, PRINCESS LIMITED, TORONTO.



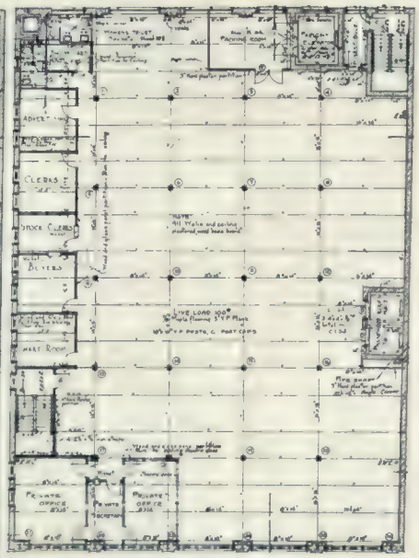
PREMISES OF PRINCESS, LIMITED, TORONTO.
DENTSON & STEPHENSON, ARCHITECTS.



GROUND FLOOR PLAN.



SECOND FLOOR PLAN.



TYPICAL FLOOR PLAN.

ADAMS FURNITURE COMPANY'S BUILDING, TORONTO.

WM. STEELE & SONS CO., ARCHITECTS.

GROUND FLOOR: ADAMS FURNITURE COMPANY'S BUILDING, TORONTO.

Adam's Building, Toronto

The new building of the Adams' Furniture Company, Toronto, is one of several developments which have been recently carried out due to changes in leases in the downtown business section. It not only provides premises well suited to the needs of the owner, but at the same time represents a noteworthy improvement in the vicinity of Yonge and Albert Streets, by replacing two commonplace brick structures which previously occupied the site.

The building is of mill construction, 88 x 122 ft., with cast iron supporting columns enclosed in plaster. The lower storey is of cut stone with a large frontage of glass for display purposes. Above this the facade is faced with brick having a rough texture and flecked with soft red, brown and neutral tones. This wall which faces the west, together with the north and south walls, have cantilever footings.

The plan in itself involves no special problem, but consists mainly of open floor areas with aisles dividing the space into sections for the arrangement and display of furniture. The main floor, which is 20 ft. high, has a mezzanine extending around it four sides. The typical floors have a height of 12 ft. 8 inches, and the basement a height of 12 ft. The general offices are on the second floor, and offices for the buyers, stock clerks and shipping department on the fourth and upper floors.

The building is equipped with an approved sprinkler system with all piping concealed, together with centrally located passenger eleva-

tors, and a freight hoist connecting with the receiving and shipping space at the rear.

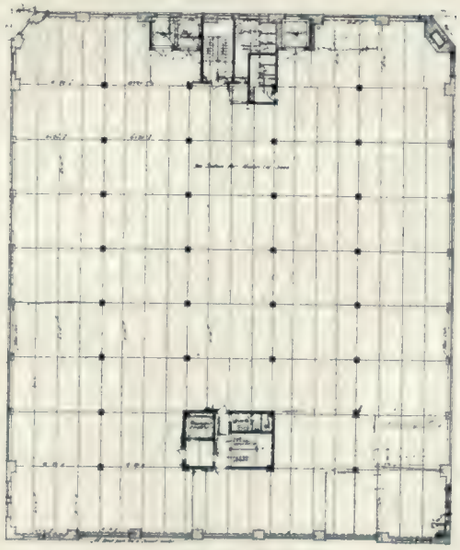
Hobberlin Building Toronto

This building was chiefly erected for the garment and needle trade of Toronto. The floors are 120 x 145 ft., giving an area of 17,400 sq.ft. to each floor. The height of the building is seven stories and basement, making a total of 140,000 sq.ft. for the entire building. The feature of the design is that is ensures a maximum of interior light, notwithstanding the width of the building. This has been accomplished by adopting steel mill construction which allowed of the use of about 90 per cent. of glass, the sash units being approximately 15 x 23 feet.

The floors are designed to carry a live load of 150 lbs. per sq.ft., the flooring itself being three inches thick. The resting and intervening beams are placed on six-inch centres, and all heavy timbers were put in place in two or three sections to avoid checking. The columns of the basement floor are 20 x 20 inches, consisting of four 10 x 10 inch timbers. The principle beams are 16 x 20 inches, consisting of two 8 x 20 inch timbers. The super floors are of mastic 1¼ inches in thickness.

The building is equipped with four high speed elevators, sprinkler and water curtain, and was completely erected in 78 days. Over 1,000,000 ft. of B. C. fir were used in its construction.

NEW HOBBERLIN BUILDING, TORONTO.



TYPICAL FLOOR PLAN.

The Legislation Committee of the Toronto City Council is considering a proposal to exempt all houses erected at the present time from taxation for a period of three years.

Post War Architectural and Building Problems

An address by Charles H. Whittaker, American Institute of Architects, before the recent Ottawa R.A.I.C. Assembly.

ANY of the several phases of my subject would be quite a large order for me to talk about, and yet all of them are so intimately related that it comes down to describing or narrating, as best I can, where the profession in America is finding itself at the present day in relation to its problems of practice as individuals, and how much greater it is finding its problems and adjusting itself to changes in the building trades brought on by the war, and also the tremendous problems being raised by the expansion of our communities and our big cities.

We are passing very rapidly from the stage of individual problems into the stage of great community problems; and they are very pressing problems, and we have a crisis on the way.

All of these things came about so far as the profession in America was concerned, I suppose, as a result of the war very largely. Of course when the war burst upon us there was a serious complaint that architects were not appreciated by the Government, and that the profession was being overlooked. Towards the close of the war, in fact, before we had any idea that the war was to end when it did, I believe the Institute (A.I.A.) appointed a committee to undertake a little more extensive survey of the practice of architecture in the United States, and very generously gave that committee $10,000 with which to do its work. It was quite the largest thing the Institute has ever tried to do, and the committee was organized both within and without the Institute, because the American Institute of Architects is only partly representative of the profession in the United States.

We tried to make the committee very general, and to draw into it all the architects, whether they were affiliated with the Institute or not.

That work went on for something like two years, I think. It did not develop anything that we did not know before, but it had one very great effect—it did concentrate the attention of architects for a certain period on problems with which they were quite unaccustomed to deal.

We were able to raise questions for discussion both in the Institute Conventions and in the Chapters (of which there are forty in the United States), and for the first time in the history of architecture in the United States we really got architects down to a national discussion of the problems with which we were faced.

The end of it was that I think the great majority of us became convinced that if we wanted to solve the problems that we called architectural and as related to the practice of architecture we should have to dig pretty deep into the business of building. A few of us had thought that for a long time, but I think it is pretty well understood in the United States now that architecture, the art, and building, the business, are two quite separate things, and that they do not go along side by side the way we think they ought to go.

Out of the report of the Post War Committee it was recommended that a study be made of the building trades in England and what they had been doing, and the last convention of the Institute authorized the directors to undertake such a study if they could. All of this crystalized in a meeting held in Chicago last Monday (Sept. —) at which for the first time in America we got together representatives of practically all the major elements of the building industry—architects, engineers, manufacturers, contractors, and labor leaders. That conference was called as a result of the preliminary discussion we had at Atlantic City in August, and its object was to make a survey of the building industry in the United States, and in some manner to find ways and means of raising the money necessary to make such a study.

Of course it came about, as I said, very largely on account of the serious study of the building industry in Great Britain that was made by the Committee on Scientific Management and Reduction of Costs of the British Trades Parliament. I have no doubt most of you are familiar with the report of that committee. It was a very startling document, which, as a principle, recommended that the building industry of Great Britain be transformed into a public service. I think this is the most remarkable document that has come out of the war as bearing on the question of industrial relations, because it was made by a committee composed of an equal number of employers and employees.

I do not think there is any doubt among the great majority of the profession in the United States to-day but that we are faced with problems in architecture which have their roots in our economic system, and one of the tasks which this Congress at Chicago will have to carry out if things go as promised, is to make a study of the building industry as a machine, to see how it functions, and see why it is not functioning at the present time, because the building industry in the United States is really paralyzed; it is at a standstill, except in certain directions where buildings are so badly needed that the cost does not matter, or in the case of moving picture theatres, and things of that sort.

Then, again, so far as the supply of houses is concerned the building industry is absolutely unable to function. There are very few houses being built in the United States, and there does not seem to be any prospect of houses being built.

Now, the point is to get at what is the reason for this condition.

I think up to the beginning of the war the preponderance of opinion in the American Institute of Architects so far as the development of architecture in the United States was concerned would be about like this—our function is to educate the public. We must get them to appreciate architecture. We must teach them what architecture is, what it means, and what we as architects have to offer. Our job is a job of education. I think that opinion still holds among the minority in the United States, but I think the great majority are beginning to feel that it is no use to give education unless you can also give power to utilize that education. In other words, to put it briefly, there is no use teaching the people what good architecture is unless good architecture is economically within their power.

The history of building in the United States does not show that at all. It shows that so far as the supply of homes is concerned it is quite impossible to give good architecture economically, that evidently there is something very wrong as between architecture, the Art, and building, the business. There is a great hiatus between the two, and they do not fit together at all.

I should like, if I may, to run over the three major things on which we concentrated our attention so far as this committee is concerned. They seemed pretty remote from architecture, the Art, and I am reminded here, as I am always at our own conventions, of the fact that architecture, the Art, seems to get very little discussion. On the last day of our conventions of the American Institute of Architects, two or three men rise very mournfully and bewail the fact that three days sessions have been devoted to registration, and competitions, and schedule charges, and by-laws, and this, and that, and that no one has talked about architecture. That really indicates what I think is quite a significant fact; that the business side of architecture and building is gradually encroaching upon everything else, and there is hardly any time left for architecture.

Building to-day is a business, for the most part. It is a competitive business. It is a profit making business. And when I say these things, and when I say a good many things I shall say, please do not think I am dogmatizing or that I have any hard and fast and fixed opinions. I have some opinions, but I will try to conceal them.

Just imagine we are all of us, if you will, simply going into a sort of a laboratory to try to dissect this building industry, this building business, pull it to pieces and see what it is composed of, and how it works, and why it does not work. That is the only way to get at the truth about it.

After we have made our start, the first thing that ought to come to our attention is the fact that you cannot build buildings without putting them on land. Then land has something to do with the building business. You must have land to put a building on, and I must confess it seems a rather remarkable thing to me that so many architects have not seen the connection between land and the building business.

I imagine that here, as in the United States, almost every architect has been up against the problem of the rising cost of land. Certainly we have it in the United States, and certainly the answer that we have sought in the United States has been a larger volume of building on the same piece of land in order to make the investment pay, or a cheaper kind of building on the same piece of land, or packing more people into an apartment house on the same piece of land, because it is only by one of those three that you can make the building profitable, and, of course, the building has to be made profitable.

Therefore, at the very outset you must recognize that somewhere or another the cost of land plays a tremendous part in architecture, in building, and in building progress, and unhappily the more large cities expand the higher grows the cost of land generally, and all that extra burden has to be somehow swallowed up in the building and made to pay. If you compare it with the architectural period of Greece, or the medieval period of Europe, you find the same problem did not exist.

The housing crisis which has overtaken all our cities is, as the Reconstruction Committee of the State of New York said, primarily a land problem. Your Ontario Commission said the same thing. It is being said pretty generally all over the world. It is a land problem. We cannot solve the housing problem until we can solve the land problem. Solving the land problem alone will not solve the housing problem, but it is the first thing that has to be done. You cannot escape it, and you must deal with it if you are really going to study the building industry, if you are really going to study what is the matter with building, if you are really going to study what produces the disordered congestion of our American cities. Some of our cities have brought themselves to such a pass that it seems almost humanly impossible for them to extricate themselves. I do not know what will become of cities like New York and Philadelphia, for instance. On the face of it it

seems utterly ridiculous to think of packing more people into the City of New York where they cannot possibly be handled from the point of view of transportation; where they cannot possibly have schools, and where the docks and terminals are so congested at the present time that it is almost impossible to supply them with food. There seems to be absolutely no understanding of the fact that with houses have to go a great many other things, and the result is that a good many of our American cities are face to face with problems which seem to be almost unsolvable. They cannot find the means of extricating themselves out of the difficulty.

Of course a very considerable part of the difficulty lies in the fact that they have allowed their lands to be frightfully capitalized by private owners, and of course all that burden has to be paid in an annual charge. It seems to me it is very much like continuously watering capital stock, and adding water continually to something that produces nothing.

It is one of the great problems in the building business, and several solutions are offered. So far as the United States is concerned it is a problem which we are just beginning to face really seriously.

Of course we are slowly admitting the principle that the community must in some manner find out how to control the use of land. That is why we got our zoning laws, and it was really quite astonishing that New York City should accept the principle of a zoning law, because the zoning law is a restriction upon the use of private property.

Little by little, by police restriction, and zoning restriction, and town planning restrictions, there is developing a common sense view about land, but so far as I can see not much progress is going to be made in the development of our cities or in the supply of housing or the progress of architecture until we as a nation come to accept the principle of some kind of land control.

What this shall be, what is the best kind of control, I am not sure. I do not know that anybody is sure, but when all our minds get working on the problem we shall undoubtedly find some way of solving it. This will mean an absolutely new field for architecture.

The second factor of the building industry with which the Post War Committee labored for a long time is the factor of credit. Almost all of our building operations in the United States depend upon the extension of credit of some kind from some source. Credit, I find, is a very difficult and a very elusive subject to touch, and a very delicate subject to discuss, because there is not any generally accepted definition of credit any more than there is any generally accepted definition of wealth, or any generally accepted definition of money, and the three things are somehow bound up together.

After all credit is some kind of a provision you have to make for paying people while they are doing a certain amount of work. Who supplies that is one question; where it comes from is another question. So far as our conclusions go in the United States the building industry to-day is really dominated by what we have to call the credit monopoly. It is the bankers, the investors, who are really determining mostly the kind of buildings that can be built. It is not the architect, and it is not the contractor, nor is it the workman. It is the man who is supplying the money who tells us the kind of building we can build.

At the present time the people who supply money will not lend any money in the United States. You cannot get a building loan—it is almost impossible. What would happen if credit refused to function in the building industry? It has refused to function for a long time, and the result is we are woefully without buildings, we are very short of houses. What is going to happen if private credit refuses to function? Well, the State of New York has just done a very remarkable thing; it has called a special session of the Legislature to deal with the housing situation in the State of New York. We have the position of a Government body convening for the first time on this side of the water to deal with the housing situation. It has not done anything beyond extending certain help to the renters of buildings. It has not proposed any measures which are going to provide more houses. But, the fact remains that the situation became so serious that the State of New York actually called a special session of the Legislature to deal with the housing problem. It did not call upon the architects, the contractors, the builders and the renters to tell why there are no houses, and I ask you to imagine the State of New York trying to find ways and means for building more houses in the City of New York when 33,000 farms were abandoned in that State last year.

It is a very strange commentary on modern civilization, but there is no disguising the fact that a great city is a great cancer in many ways, and that is the stage to which we are coming in the United States. Our individual problems are gradually being swallowed up in those tremendously big problems with which our communities are faced, and the consciousness of those problems is only just now beginning to dawn.

We have had projects for the city beautiful, and the city square, and the city plan, and so on, and all these were grandiose, but now we are face to face with the tragical problems of transportation, and of schools, and of houses, and the thing is rapidly passing beyond the individual stage, and, as I say, the consciousness

of this is only beginning to dawn on us, and we do not know how to meet it.

This again indicates to me that architecture, the Art, is quite helpless. It cannot come to the rescue. It ought to be able to. There is sufficient skill, there is sufficient knowledge, and there are a sufficient number of technicians qualified to solve any of those problems. There is not an architect practicing in Canada or the United States who could not find a solution for it so far as the physical problem is concerned, but, economically, it cannot be done.

Therefore it seems to me that if you are going to look forward to great architectural development, you must examine the economical system, and you must find out why it is that the business of building has been taken away from the architect, taken away from the contractor, and taken away from the workman. The master builder is gone. The whole system is gone. The business of building has passed into the competitive profit-making system, and it is being rapidly taken over so far as the United States is concerned by what we have to call the financial business. We see the great constructing firms everywhere in the United States taking over the entire functions of architect, contractor and builder. A vast amount of building operations is being carried on in that way. You would be astonished if I were to tell you the names of some of the architectural firms who are selling plans to construction companies, their functions ceasing as soon as they have made the plans. Yet, the extraordinary thing is that the architects do not seem to grasp this situation.

Here it is—they are familiar with the land problem; they know how they have to struggle to get loans for buildings; they see those construction companies coming up. Is it not time to look into the system, and try to understand it?

The third factor which enters into the building industry from the point of view from which I am speaking is the question of profits. The building industry to-day is based upon the law of profits—no profits, no building. Of course, no profits, no credit—the two go hand in hand. Is it possible to conceive a building industry carried on without profits, or is it possible that we must forever depend upon the profit-making motive? It seems to me a very curious paradox that when we glorify the men who died in the war as typifying the noblest kind of heroism, giving their lives for something in which they believed without any thought of profit, we should still cling pretty tenaciously to the fact that the profit-making motive is the only impulse upon which we can depend in order to stimulate mankind to do things. I am willing to express my own opinion upon this point, and say I do not believe it. I believe the profit-making motive is a snare and a delusion. I do not know how we are going to get rid of it, and I do not know whether we ever will get rid of it, but I do not believe it is the real motive that inspires any man to do good work—I do not care whether he is workman or king.

I do not believe the profit-making motive is going to survive forever, because it was very curious at the Building Conference in Chicago that a body of forty or fifty men all eminent in the building industry sat in a room and discussed those problems of harmony, and co-operation, and mutual service, and so on, never once mentioning the word "profits."

It is true the building industry, like all other industries, is based upon the law of profits, and I have nothing to say about the man who believes in profits any more than I have to say about the man who does not believe in profits. It does, however, seem very ridiculous to try to discuss the building industry without discussing profits. What is going to become of the profits? Who is going to get them? How are they going to be divided? That is the real problem. And, as for profiteering, what is it? Who can define it? What is a fair measure of profit for any kind of work? Is there any fair measure of profit? I defy anybody to define it.

There are those three things running through the building industry—the business of building—there is the land problem; there is the credit problem; there is the profit problem. It is my hope that this group of men who are working on the matter will be able to make a really serious study of the whole thing, and that they will be able to lay the facts before the industry, and that they will at least begin to make the building industry understand the nature of the machine, how it functions, why it does not function, and what all these things mean. They should not discuss such questions as co-operation, and so on, because those questions are all beside the mark until you have decided what you are going to do about the profits, how much the profits are going to be, and who is going to get them.

That is why I am very much interested in the Building Guilds in England. They have not got very far, it is true. There are about fifty of them in existence at the present time, and two or three of them are working on building projects, one to quite a considerable extent. But, the Building Guilds in England in all their negotiations with the Government and in all their negotiations with municipalities, have clung tenaciously to the principle that they should should carry on their work without any profits. They have offered to supply the labor for carrying out those building operations—of course almost entirely housing. At first they worked on the basis of 10 per cent. to cover the cost of plant, superintendence, and things of that kind. It was not to be distributed as a

profit. In the final agreement approved by the Ministry of Health it was reduced to four per cent. They have clung absolutely to the theory that there are to be no profits in what they will do. The workman says: "Give me an acceptable wage, and guarantee me continuous work, and the community shall pay no profits for having its building carried on." Of course, this is a new motive in industry. I do not know how far it will go, and I do not know what fruit it will bear, but all of those things are educational and they all indicate that there is dawning a consciousness of the fact that the building industry does not function primarily in the service of society, but functions primarily in the service of profit-making business.

That really covers the history of what has been happening to the American Institute of Architects since the war, and indicates the line in which I think the majority is travelling. As I said I hope this conference in Chicago will make a really practical, scientific and economic analysis of the business of building, so that architects, contractors and workmen may be made understand what is wrong.

I need hardly dwell on the Trades Union situation. It is the dreadful condition with us in the United States. I should think the most backward trades unions we have are in the building industry. The Post War Committee discovered, and I think we all know, that the quality of workmanship is steadily declining among the trades in the United States, not only since the war, but even before the war, and none of the building trades are drawing to themselves the kind of men they have had in the past. Skilled labor is a very difficult thing to find.

Competent labor is almost impossible to find. This again is another condition with which the building industry in the United States is going to be faced in the future. I do not think anyone knows where the workmen to carry on such operations are to come from. They cannot be found. We have not got them. We have not been training them. We have not been educating them. I suppose the reason is that we have not been offering the incentive.

I have given you roughly this history of what really started with the work of the Post War Committee of the American Institute Committee of Architects, and I have brought you as far as we ourselves have been able to go. I have not the faintest idea of what is likely to develop in the future.

My hope is that more and more architects especially will be willing to look at those things broadly, and impartially, and fearlessly, and try to understand them; because we have quite a different condition at the present time from the conditions which existed when architecture was a great art. We have a great industrial system, a great business system, and a great competitive profit-making system. They are facts. We are living under those conditions, and they must be faced. The matter has to be studied, and I think we must rebuild carefully, slowly, and patiently, because if we do not rebuild in that way the whole structure is likely to collapse which is a thing none of us wants to see.

So, if I have any message at all to the architects of Canada, it is that they concern themselves with trying to get at the real facts and the real truth about the building industry and the going machine.

Inter-Allied Housing and Town Planning Congress of 1920

(*Continued from page* 309.)

an impression, the forms are taken apart and re-erected on the top of the wall just completed.

The success of the work depends on the use of rigid forms, on the freeing of the soil used from larger stones and upon its thorough ramming. The work, it is stated, is extremely easy and can be carried out by unskilled labor.

The cost of the walls for the house built by Mr. Ellis was under £20. The estimate for the same amount of walling in brickwork was over £200.

A brick footing was used in a concrete foundation, but in later buildings the pise wall is built directly on to the concrete.

The exterior walls are whitewashed; the interior being plastered.

I shall always cherish memories of the English countryside in June; it is then altogether beautiful. The manor house with its shaven lawns and mighty oaks; the thatched diamond-paned cottage with its gay profusion of flowers; the grey old church; the village inn—I'm speaking without inside knowledge of the inns—all these make a picture that brings joy to the heart of the architect.

With the great cities, however, it is different. They are frequently grim and ugly, of Liverpool and Manchester in particular I formed this impression. I remembered a story of Judge Parry, then of the Manchester County Court, who had brought up before him a man charged with drunkenness. The Judge asked the unhappy wayfarer why he was drunk, and the man explained that he had been saving up to go away from Manchester, and had then had practically all his money stolen from him, and so in a fit of despondency he had used what remained to get drunk with. "Ah well," said Judge Parry, "perhaps that is the quickest way out of Manchester."

Canadian cities appear brighter and cleaner; they are as yet, at all events, better places to live in than the average English city, but they can only continue to remain so by our taking thought for the morrow in the combined matters of housing and town planning.

O. A. A. Notes

The first business meeting of the new Council of the Ontario Association of Architects was held in Toronto on Tuesday evening, Sept. 21st, with President Moore in the chair. Others present were: Messrs. Allaster, Hynes, McGriffin, Page, Shepard, West and Wickson.

Standing committees were appointed as follows:

Board of Admission—Andrew Sharp, convenor; John M. Lyle, Henry Sproatt.

Editing and Publishing Committee—R. K. Shepard, convenor; F. H. Marani, H. F. Secord, B. Frank Kelly, J. L. Kingston.

Publicity Committee—Joseph Banigan, convenor; Chas. S. Cobb, R. B. McGiffin, Gordon M. West, F. A. Belfry, George T. Evans, John M. Watt.

Architectural Competition Committee—Vaux Chadwick, convenor; Stanley Fryer, Allan George, Gilbert Jacques, A. J. C. Paine, J. M. Watt, Murray A. White.

The following representatives were also appointed:

Canadian National Exhibition—A. Frank Wickson.

Art Gallery of Toronto—William Rae.

College of Art—Stamford Warrington.

Advisory Conference Committee—J. P. Hynes, Forsey P. Page.

Board of Trustees of the G.W.V.A. Club House Fund—A. H. Gregg.

Special Botanical Garden Committee—W. Ford Howland.

Ontario Fire Prevention League—Victor D. Horsburgh.

Joint Industrial Council of the Building Trades of Toronto—J. P. Hynes.

The President called attention to the employment of an U. S. architect to make additions to the Western University at London. In this connection Mr. Hynes' suggestion to interview the Minister of Education was adopted.

The President reported that he had written to the Hon. Sydney Fisher with regard to the competition for the Laurier Monument at Ottawa. This matter was referred to the Competition Committee.

The President laid on the table the correspondence with Mr. Stanley Fryer with regard to the War Memorial at Hamilton.

The President also submitted correspondence with Mr. Willis Chipman with regard to the form of legislation recommended at the convention.

Mr. Shepard submitted Certificate of Membership as drawn by Mr. McDonald, which was approved, subject to slight changes in the wording. The members will be charged $1 each.

A letter was received from Mr. F. V. Johns, Assistant Provincial Secretary, with regard to competition to be held in connection with the British School at Rome. The scholarship will be of the value of £250 per annum for three years. Particulars can be obtained from the Secretary.

A letter from the Royal Architectural Institute of Canada was read stating that Mr. Andrew T. Taylor, late of Montreal, has been appointed on the Special Committee selected by the Royal Institute of British Architects to consider the question of "Unification and Registration," and asking for information. This matter was referred to the Editing and Publishing Committee.

Several cases having been reported to the Council of firms wrongfully advertising as "Registered Architects," it was decided that in every instance where this title is improperly used, attention be drawn to the contravention of the Act by the association's solicitor.

The President was authorized to deal with routine business between meetings of the Council and report at the next meeting.

In the matter of clerical assistance the President, Treasurer and Secretary were authorized to make such arrangements as may be deemed necessary.

Hamilton Meeting

Pursuant to the active campaign of association work decided on at the London convention a meeting of the Council of the Ontario Association of Architects was held at the "Wentworth Arms," Hamilton, on October 9th, with President Moore in the chair and the following members present: Messrs. Hynes, Kelly, McGiffin, Page, Shepard, Watt and West.

An article in the London "Free Press" was read in reference to the contemplated extension at the Western University. The President explained what had been done towards interesting the Provincial Government in the Association's protest against the architectural work for this proposed new building being done outside of Canada. A telegram was read from President D. R. Brown, of the R.A.I.C., endorsing the attitude of the Council in this connection. It was decided to send a letter to the Board of Governors of the Western University, to be prepared by the President and the Publicity Committee.

The Secretary was directed to write to Mr. F. R. Ewart, Secretary of the Advisory Conference Committee, advising that the Council desires further information from various

sources before coming to a decision with regards to legislation, and was not in a position to make a definite statement at the present time.

The President reported regarding the Laurier Monument Competition that enquiry had been made as to the names of the assessors, but that no reply had been received.

The Board of Admission report from Mr. Sharp was read, and the following were admitted to full membership: W. C. Chamlers, Ottawa; Jas. S. Russell, Stratford; W. M. Moorhouse, Toronto; J. M. Cowan, Toronto; L. G. Bridgeman, London; W. G. Murray, London.

The Secretary was directed to write the Solicitor, Mr. Grier, to ask as to what action has been taken with regards to non-members of the O.A.A. who are using the title of "Registered Architect."

The matter of more clerical help for the Secretary and a possible small office with telephone was discussed, and left with Mr. Moore and Mr. Wolsey to take up with the Engineers' Club.

The Editing and Publishing Committee reported through Mr. Shepard that Construction had offered to publish a page of association notes every month. This offer was accepted as it was felt by doing so information relating to the affairs of the Association would reach more of the profession than in any other way. The Secretary was accordingly instructed to stop sending out copies of the minutes as has been done recently, as same will appear hereafter regularly in Construction.

The Publicity Committee reported through Mr. West the result of their last meeting. The committee favored the idea of an educational campaign both within and without the association.

Mr. Moore stated at the recent annual assembly of the R.A.I.C. the annual per capita assessment of the provincial associations had been increased from $2.00 to $5.00.

OPEN MEETING.

Following the Council session an opening meeting was held in the evening when in addition to the Council, seventeen Hamilton architects were in attendance.

Mr. Moore told of the objects of the Association and its aims, and explained that the purpose of the meeting was to have the Hamilton Chapter again become active and to have all the Hamilton architects take an interest in the Chapter activities. Various phases of the Association's work with regards to the Industrial Council, publicity campaign and proposed architectural clinic were explained by members of the Council.

The Hamilton architects present were all keenly interested in having the Chapter resume its work, and decided to call a meeting for reorganization on October 12th.

Letter re Western University

On October 9th, an interview quoting Lt.-Col. Walter J. Brown appeared in the London "Free Press in reference to the protest of the Ontario Association of Architects in regards to plans for the Western University extension. The interview is given herewith in part:

"The protest of the Ontario Architects' Association regarding the employment of American architects in preparing plans for Western University buildings is extremely unfortunate.

"The plans prepared for the new university buildings are a gift of a friend of the University, and are designed to enable those interested in the University's development to get a good idea of collegiate-gothic type of architecture, and at the same time to look forward far enough to avoid the architectural blunders which have occurred in the building of other Canadian institutions of higher education.

"The plans are still tentative as they have not been finally accepted by the board of governors. The interior details for library and reading-room space, class rooms and laboratories must, of necessity, be worked out by the teaching staff. The clothing of these designs with form and beauty is the work of the architect. Arrangements are already well advanced whereby competent local architects will be employed to work out the details along similar lines to those followed in the case of the new medical school building.

In reference to the foregoing the following letter was sent by the Council to the publishers of the "Free Press."

October 11, 1920.

To the Editor:

With reference to the statement of Lt.-Col. Walter J. Brown which was published in your issue of Saturday, October 9th, concerning the protest of the Ontario Association of Architects, respecting the reported preparation of designs by foreign architects for the Western University Extension, we wish to point out that having failed by direct effort to obtain information from the University authorities on this matter, we consider it desirable to clearly state our position through the Press.

As Col. Brown, in the article referred to, has taken occasion to characterize our protest as unfortunate, explaining "that the Plans are the gift of a friend of the University, that they are designed to get a good idea of Collegiate Gothic type of architecture, and at the same time to look far enough ahead to avoid architectural blunders which have occurred in the building of other Canadian Institutions of higher education" we consider it advisable in the public inerest, and as a duty to the profession in this country, to issue he following statement.

The Ontario Association of Architects believes:

1. That the Western University, being a Canadian public educational institution, receiving support from the Government of this Province to the extent of some Sixty-five to Seventy-five Thousand Dollars per year, should, in as far as it is possible to do so, pursue the policy in its development that will conserve the resources of the country for development, by the brain power which it produces.

2. That any action which the University has taken, or may take, in entrusting the architectural design of such a Canadian public building to foreign architects, is a direct violation of the economic principles above set forth, and which it, as a University, should be the foremost to uphold.

3. That if we are to have in this country, a national spirit, or a national character, it will never be created or maintained by entrusting its public institutions to those who are not desirous of its inheritance, and to the exclusion of those who, by virtue of citizenship, sympathy, environment and ability, are entitled to paricipate in its welfare and development.

Referring to some of Mr. Brown's remarks, it is not the purpose or intention of this Association to enter into any newspaper controversy on the relative merits of American and Canadian architects, further than to say we believe the work of Canadian architects as reflected in the design and execution of buildings in connection with Toronto University, Victoria University, Knox College, McGill University of Montreal, and several of the recent Western universities, does not suffer by comparison with anything that has been produced on this continent.

The inference which one may draw from Mr. Brown's

statement that Collegiate Gothic designs as suggested by photographs published in the Press, and planning of a character to suit the purpose and requirements of the University, can only be successfully carried out by architects from another soil, in conjunction with the University authorities, leaving the execution of the work to local architects, is almost incomprehensible, and leaves us to be "the hewers of wood, and drawers of water."

With all due respect to the opinion represented by Mr. Brown, and to American practitioners (with whom we have no issue), we fail to perceive any just reason why the Board of the Western University should go beyond our borders for the design of the University buildings, furthermore, we cannot be expected to sit passively by and accept such a procedure without strong protest.

We believe that in bringing this matter to the attention of the public, we are acting in the best interests of the University, of the citizens of London, and the country at large.

Signed on behalf of the Council of the Ontario Association of Architects.

R. B. WOLSEY,
Secretary.

Toronto Chapter Luncheons

Luncheon meetings were held at the Hotel Mossop on Sept 20th and 30th by the Toronto Chapter of the Ontario Association of Architects. Nineteen members attended the first luncheon and thirteen the second, with Mr. Horsburgh presiding on the two occasions.

At the first meeting Mr. Hynes introduced the subject of the steel workers strike and explained the working of the Joint Industrial Council of the Toronto Building Trades. A committee was appointed to endeavor to influence the contractors involved to settle their difference through the Joint Industrial Council.

At the second meeting Mr. Shepard spoke on the starting of a free architectural clinic to reach those who were building their own homes and who would not likely come to an architect. A committee of Messrs. Shepard, Dolphin and Lee was appointed to get in touch with the G.W.V.A. to explain the purpose of the clinic and the service which the Association aims to render.

A letter was read from Mr. Somerville as follows:

September 29th, 1920.

As I am unable to be at the luncheon to-morrow, I am doing the next best thing; writing to tell you what my idea was regarding the question of establishing an Atelier. Briefly it can be stated as follows:

PURPOSE: (a) For the training of the younger men who have entered offices directly from the technical high schools and who are unable to take the university course. This training to be under the direction of experienced practitioners, in order to develop these men into skilled, proficient draughtsmen in the shortest possible time. (b) To give those men, who have enough ambition and energy to want to improve themselves an opportunity to do so, without leaving the country and depriving the Architects of the services of the best type of draughtsmen.

BENEFIT TO ARCHITECTS: By developing the usefulness of juniors making them more available. Most boys coming from high school are under the impression that they can make drawings. In most cases they have an elementary idea of what is required and with a little training in the purely manual preparation of drawings would be doubly valuable. This with the knowledge of design gained by the atelier training is as valuable to the architect as it is to the draughtsman.

Will keep the better types of draughtsman in Canada and they will be trained according to the ideas of Canadian architects. At the present time the large majority of our architects receive their training in the offices of American architects, American colleges, and the ateliers of France or the United States. Will the Government or the general public ever do anything to remedy this if the architects themselves do nothing but howl about it and ask some one else to do something?

We have got to have a decent University course; we cannot provide that ourselves; but we can help the men in our own offices and largely to benefit ourselves, establish an Atelier for the improvement of our junior draughtsmen.

Mr. Hynes opposed the idea at the last meeting on the plea that it would interfere with his pet idea of legislating the entire Association into Utopia where no American architects, engineers or other undesirables can obtain admission. All support to his efforts, his good work should be properly appreciated by us all, but in the meantime let us do something for those men whom his educational programme does not cover. There is surely no danger of having too many highly trained draughtsmen.

I was glad to learn that this question had been brought up before by Mr. Cobb. I understand he is willing to devote a portion of his time to it and has already taken the matter up with some of the draughtsmen. If an Atelier is established we will all be benefited by it and it seems only just that the Association should stand back of it.

I might add that I am one of a number of men grateful to John M. Lyle for his tireless efforts in starting an atelier in Toronto a number of years ago.

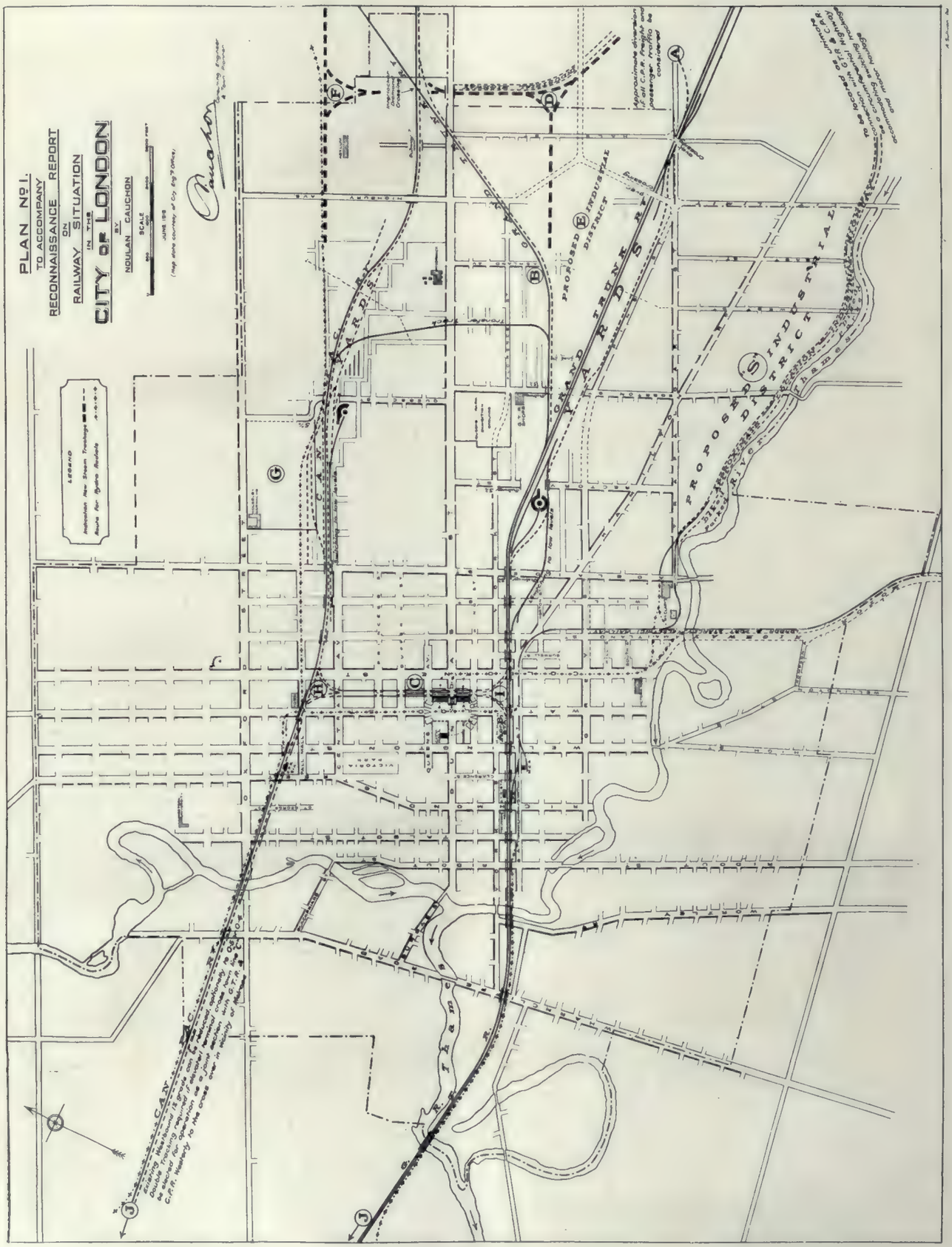
Yours very truly,
(Signed) W. L. SOMERVILLE.

The feeling of the meeting was that such an atelier should be started now, but definite action was deferred until the next meeting.

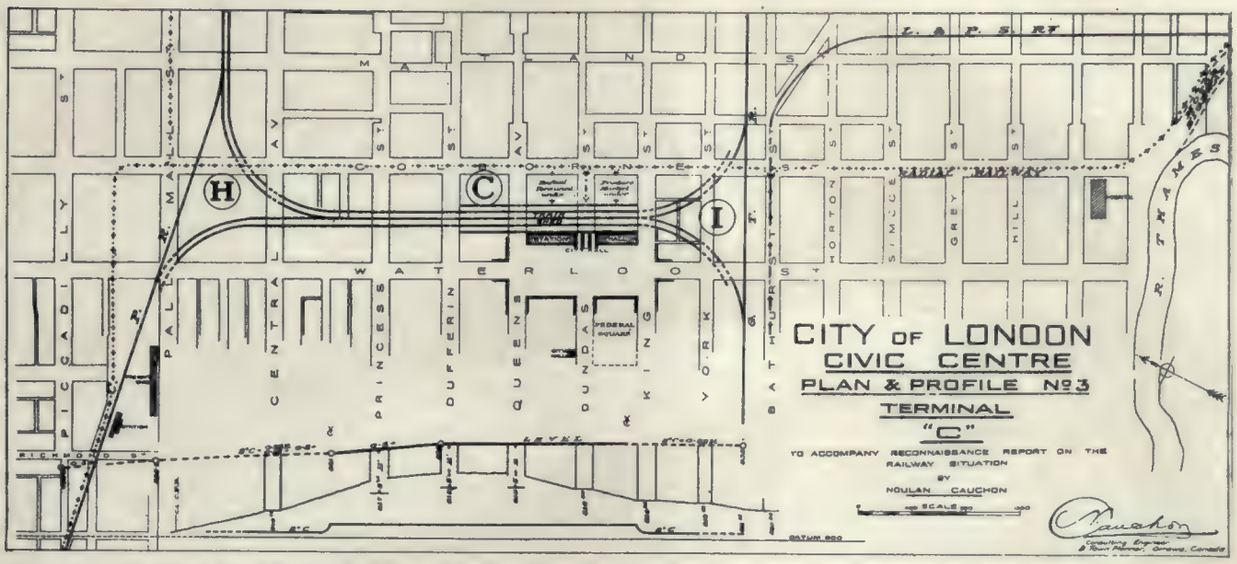
The Latest at Greenwich Observatory

Once every year a rather quaint ceremony is observed at Greenwich Observatory. An inspection of the Observatory is made by a "Board of Visitors" to whom the Astronomer-Royal presents a report on the work of the preceding twelve months. The latest reports shows that although the Observatory was founded centuries ago, at the very dawn of scientific navigation, it keeps in line with the latest developments. A new aerial has been erected to extend the range over which wireless time signals can be received. These signals are now received regularly from the Eiffel Tower, Nauen, and Annapolis. The Observatory also controls the operation of time-balls in different parts of the country. These time-balls are hoisted on a prominent mast and released at specific hours by an electric signal from the observatory. The accuracy of the operation is checked by a return signal from the distant time-ball. Greenwich also controls "Big Ben," the famous clock of the House of Parliament, London.

Jade, though little used by Europeans, is still prized by the Chinese and other Asiatics, and is especially notable for its extensive use in every continent in prehistoric times. Ornaments and utensils of this stone are found among the lake dwellers of Switzerland, the ancient peoples of France, Mexico, Central America, Greece, Egypt and Asia Minor.



PLAN ACCOMPANYING RECONNAISSANCE REPORT ON THE RAILWAY SITUATION AT LONDON, ONTARIO.



PROPOSED CIVIC CENTRE AND UNION TERMINAL FOR LONDON, ONT., RECOMMENDED IN THE CAUCHON REPORT.

Synopsis of Cauchon Report on Railway Situation in the City of London, Ont.

THE following is a synopsis of Mr. Naulon Cauchon's report on the railway situation in the City of London, Ont., and formed the basis of an illustrated address delivered by Mr. Cauchon personally at the luncheon tendered jointly by the City Council and the Chamber of Commerce to the visiting architects at the recent convention of the Ontario Association of Architects held in that city.

The essential features of the scheme and the nature of the improvements contemplated are indicated in the two accompanying plans.

The idea of having one railway entrance and the elimination of others, one union terminal company for all freight and passengers, is implied—but, in view of Parliament having withheld full power from the Railway Commission to deal with existing terminals; of the railways being free in the matter of negotiations and of their constitutional disinclination to merging identity, etc.; of the limited size and financial strength of London to bear its probable proportion of such a scheme as would involve the total abandonment of the C.P.R. for over ten miles; or of diverting only the passenger service and the disability to the C.P.R. of having, notwithstanding, to elevate its main line on account of freight traffic, an alternative has been submitted known as Union Terminal "C."

The full elevation of the main lines of the G.T.R. and the C.P.R. is recommended, from Adelaide Street westerly to and beyond the river; Adelaide Street and easterly to be partially elevated and the streets to be proportionately subwayed. This means the complete elimination of all level crossings in London on all running tracks; the industrial tracks to remain on surface level with switching regulated and protected.

From 1900 to 1918, inclusive, there were twenty-eight people killed and seventy injured on the level crossings.

Two extensive industrial areas to be municipally owned, capable of expansion, have been selected and trackage proposed to give access to them from both railways and freedom from all inter-switching charges. These industrial areas are adjacent to main sewers and public utilities.

If London is to enjoy a Union Terminal for passengers, the Engineer and Town Planner thinks that the solution lies in a line elevated for three-quarters of a mile across the city connecting the G.T.R. and the C.P.R. elevated main lines. This terminal is to be municipally owned but leased to a terminal company in which the two railways would be equally represented, and be operated with the G.T.R. and C.P.R. main lines westerly as far as "Melrose Junction," as a "joint section" for passenger business only.

A Civic Centre is proposed at the intersection of Dundas and Waterloo Streets with the latter enlarged to form a spacious square, upon which the new terminal station would face, right in the heart of the city and at the almost exact centre of its population. The Civic Centre Square is to be created by taking one row of lots for two blocks on each side of Waterloo Street. This traffic square would be about 1,100 feet on its long axis north and south, and about 370 feet wide on the axis of Dundas Street, containing over nine acres, of which about 60 per cent.

would be composed of already existing street areas. About four acres only are required to be purchased. There would be eight streets, each 132 feet wide, leading out of this square.

It is also proposed that the new City Hall be built directly on the axis of Dundas Street, facing upon the Square; the traffic to pass under the Civic and Station buildings by wide arches.

Recommendations are made for the removal of the Asylum and also the Barracks from where they block street extension and development, to sites outside on the city-owned London and Port Stanley electric railway, this also aiding in the building up of this latter holding.

Provision has also been made in the plan for all future steam or hydro-radials to use the common entrances of the scheme free from level crossings, and thus avoid any further cutting up of the city by new rights of way.

Many other co-related features of the city's enhancement are analyzed and provided for, which will prove most interesting to the citizens of London and to those of other cities and towns which are facing railway and development problems.

This reconnaisance report on London was made by Mr. Cauchon for the London Chamber of Commerce as an indispensable preliminary to the further advance of the general town planning which they favor. Speaking at the luncheon, Mr. Cauchon recommended that the report be published in full in pamphlet form for the citizens' information and judgment.

The proposal was subsequently endorsed by the architects attending the convention, and resulted in the passing of a resolution recommending its adoption to the city, the feeling being that it would assure a systematic and beautiful development of the city.

Electric Cooking for the British Worker

Electric cooking apparatus in Great Britain is finding its way into the working class dwellings constructed under the numerous "housing schemes" undertaken by local authorities or by private enterprise. In one large colony every house is being equipped with an electric cooking range, two electric fires and an electric copper for washing purposes. There is only one chimney in the house, an open-fire being used for burning refuse and also for warming (by means of a boiler at the back of the fire) the water for baths and other uses. The construction of the houses, it is said, is so much simplified by the use of electric cookers and heaters that the total cost, including all the electrical appliances, is less than that of a similar house built in the ordinary way. Electric light is, of course, installed. The electric ranges are large enough to cook ordinary workmen's meals for seven or eight persons.

STORE AND OFFICE BUILDING, BLOOR AND NORTH STREETS, TORONTO.
C. J. GIBSON, ARCHITECT.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor
W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.
Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, Oct, 1920 No. 10

The Toronto Architects Clinic

The gratuitous offer of the Toronto Chapter of the Ontario Association of Architects to conduct an architectural clinic for the benefit of the small house builder, is indeed to be commended. There is in the heart of every community workmen and other individuals who desire to own and live in their own homes, but whose means will not permit them engaging the services of an architect. They invariably get out rough plans themselves and build the best they can, and it represents a class of work which never comes to an architect's office. It is for the purpose of assisting such individuals that the proposed clinic is being inaugurated. The intention as we understand it is to hold these clinics under proper neighborhood auspices, at which free architectural advice will be given to small investors submitting their own plans.

In doing this the architects will not only be rendering a real service to the owners of small homes, but to the community at large, in that it will result not only in better consideration being given to the designing and planning of such dwellings, but will to a large extent prevent the erection of that class of structures which has too often proved detrimental to neighborhood development.

The proposal has reached the stage where it has been submitted to the Toronto branch of the Great War Veterans Association and has met with full acceptance from that body. The principle in a more direct way follows a similar movement in the United States where under the direction of the Minnesota Chapter of the American Institute of Architects a periodical is being published, containing advice to small house investors, together with sketches and plans of which blue prints can be obtained for a small sum. A similar publication might eventually be started here in Canada, but much will depend on the spread of the clinic idea to other cities, as well as the time and co-operation architects elsewhere might be willing to give in furthering a more general movement along these lines.

THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA.

Montreal, Que., October 7, 1920.

Editor, "Construction":

Dear Sir,—I beg to inform you that at the last session of the Thirteenth General Annual Assembly of the Royal Architectural Institute of Canada, held at Ottawa, on the 1st and 2nd October instant, a special vote of thanks was unanimously adopted to be sent to you for your generous co-operation in making such a success of the Assembly.

Yours very truly,
(Signed) ALCIDE CHAUSSE,
Hon. Secretary.

Toronto Builders' Exchange Reorganized

Members of the Toronto Builders' Exchange held a recent meeting in the Board of Trade rooms in the Royal Bank Building to deal with the proposed reorganization of the Exchange, which had already been submitted to them in the shape of a new constitution drawn up by the board of directors and business manager Reynolds. With some changes in the constitution and by-laws the reorganization as proposed was endorsed by the meeting.

The name of the exchange was altered to "The Builders Exchange and Construction Industries of Toronto." This change was made to make it more inclusive in character so as to take in all supply firms and branches of the contracting business.

As a result of reorganizing it is felt that the Exchange will be able to adopt a more progressive policy. The obect is to make it a more useful and influential organization, and to bring it up to the highest point of service to both its

members and the public. Among other things an endeavor will be made to establish trade schools for artisans in the industry, and to promote concerted action in reference to the question of labor and related problems. There is also a possibility that some effort will be made to induce the Board of Control and the Board of Education in reference to schools and civic buildings to have plans and specifications submitted to the Exchange for constructive criticism. It is felt that if this is done certain economies in construction could be effected with a corresponding financial saving to the city.

New Associate Professor at U. of T.

During the past month the staff of the University of Toronto has been increased by the arrival of Professor Adrian Berrington, who is assuming the duties of Associate Professor of Architecture in connection with the School of Practical Science. Prof. Berrington, who has had a wide experience in both France and England, comes direct from Paris, and has a distinguished war record to his credit, having served five years (less two months) and being wounded twice. His addition to the university staff is in accordance with the policy announced some time ago by Dean Mitchell, which aims to substantially improve the present course offered to architectural students.

Crouse-Hinds Company to Build

In order to more adequately meet the demand for their well known products, the Crouse-Hinds Company have purchased a five acre site with track facilities for the erection of a large new modern plant at the corner of Hanson St. and Coxwell Ave., Toronto. The main building of the new plant will be 500 x 80 ft., and either three or four storeys high. In addition to this a foundry, 300 x 60 ft., will be erected, together with a fireproof pattern warehouse approximately 100 x 100 ft., and two stories high. The buildings will be of the modern daylight type, of brick and mill construction and will be equipped with sprinklers throughout.

Plans and specifications are now in course of preparation and ground will be broken about May 1st, so that the plant will be ready for occupation in November, 1921. The plant will cost $500,000 for buildings alone and when completed will be occupied jointly by the Harvey Hubbell Company, the Hubbell-Mack Machine Screw Company and the above concern. This will make three plants that the company will have under operation in Toronto, the other two being factory No. 1 on Labatt Ave., and factory No. 2 on Carlaw Ave., all of which will be under the supervision of Mr. E. G. Mack, managing director of the three companies.

The Cylindrical House

The house can be no wider than its lot, but it may be wider than its foundation, and roomier by several feet than the dimensions of its side would betoken. In proof of this a Kansas City man has built a 22-foot house on a 25-foot lot, and has seven feet of yard left—three and a half feet on each side. He accomplished this remarkable feat by making his house cylindrical. Far from sacrificing any element of beauty to the unusual design, the appearance of this novel dwelling is entirely pleasing, outside and in, says the "Western Contractor." The foundation measures 18 feet wide by 36 feet long, with its walls vertical up to the swell of the cylinder. The basement windows are round port holes giving a nautical effect, and perched in the centre of the room, like a turret, is a little sleeping porch. The roof itself is a segment of a cylinder, extending over the front porch. Inside are four good-sized rooms and a large hall, which serves as a spare room by virtue of a built-in-bed, occupying the curve of the wall.

CONTRACTORS and SUB-CONTRACTORS

ADAMS FURNITURE COMPANY'S BUILDING, TORONTO.

General Construction, Frid Construction Co.
Brick, Sun Brick Co.
Plumbing, Purdy, Mansell Co.
Heating, Purdy, Mansell Co.
Sprinklers, Purdy, Mansell Co.
Steel Sash, Henry Hope & Sons.
Elevators, Turnbull Elevator Co.
Steel Work, Toronto Steel Construction Co.
Cast Iron Columns, Hepburn & Disher.
Painting, Fred. Roberts Co.
Plate Glass, Consolidated Plate Glass Co.
Store Front, Consolidated Plate Glass Co.
Roofing, Canadian Johns-Manville Co.
Sheet Metal Work, Douglas Bros.
Kalamied Door, Douglas Bros.

HOBBERLIN BUILDING, TORONTO.

General Contratcors, Yolles & Rottenberg.
Brick, Don Valley Brick Co.
Window Construction, A. B. Ormsby and Co.
Electric Fixtures, MacDonald & Wilson.
Electric Wiring, Canada Electric Co.
Elevators, Otis-Fensom.
Expanded Metal, Trussed Concrete Steel Co.
Fire Doors, Robert Olsen.
Flooring, Mastic, H. H. Symons.
Glass, Toronto Plate Glass Co.
Heating System, C. A. Dunham Co.
Marble, Italian Mosaic and Tile Co.
Plumbing, Marison and Buchanan.
Reinforcements, Trussed Concrete Steel Co.
Radiators, Dominion Radiator Co.
Roofing, Carmichael Waterproofing Co.
Stone, Natural, Peerless Art Stone Co.
Structural Iron and Steel, Toronto Steel Construction Co.
Tiling, Italian Mosaic and Tile Co.
Vault Doors, Taylor Safe Works.

PRINCE'S LIMITED, TORONTO.

General Contractors, Holtby Bros.
Plumbing, Bennett & Wright.
Decorating, Murray-Kay.
Torrano Flooring, Toronto Sanitary Flooring Co.
Ventilating Fans, Sheldons Limited.
Plastering, Andrew Petrie.
Store Fronts, H. J. St. Clair.
Plate Glass, Toronto Plate Glass Importing Company.

J. P. Anglin, B.Sc., President. *H. J. Gross, Vice-Pres. & Treas.* *C. D. Harrington, B.Sc., Vice-Pres. & Manager.*
ANGLIN-NORCROSS LIMITED
CONTRACTING ENGINEERS AND BUILDERS.
MONTREAL TORONTO HALIFAX

Toronto, November, 1921 Vol. XIV., No. 11

CONTENTS

CANADA BREAD COMPANY'S NEW DANFORTH AVENUE PLANT TORONTO 325

LAND TENURE AND ITS EFFECT ON TOWN PLANNING 329
By H. L. Seymour, A.M.E.I.C., M.T.P.I.C.

BATTLEFIELD MEMORIAL DESIGNS SELECTED 325

LANSDOWNE PARK HOUSING SCHEME, BRANTFORD, ONT. 337

ASSOCIATION OF SCIENTISTS TO MEET IN TORONTO 341

ARCHITECTURAL EDUCATION 342
By Adrian Berrington, Associate Professor of Architecture, University of Toronto.

STRUCTURAL STEEL FEATURES OF THE PRINCE EDWARD HOTEL, WINDSOR, ONT. 345
By R. E. W. Hagerty, Consulting Engineer.

HOW TO BUILD A HOUSE 352
By A. Frank Wickson, Architect.

TOWN PLANNING IN ONTARIO 352
By J. P. Hynes, President of the Ontario Town Planning and Housing Association.

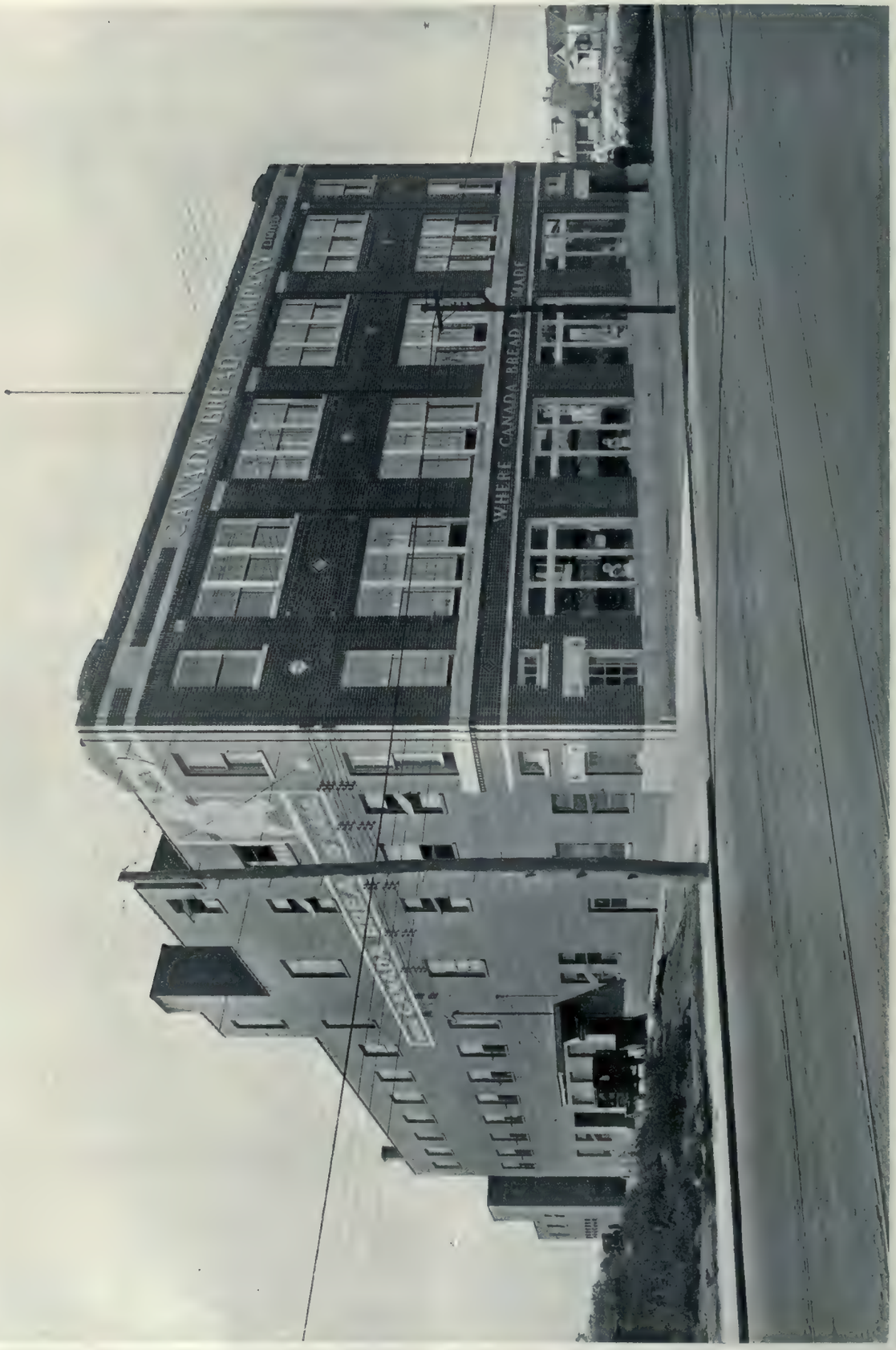
ECONOMICS OF TOWN PLANNING 354
By Naulon Cauchon, Chairman of the Town Planning Commission, Ottawa.

CONSTRUCTION INDUSTRIES TO MEET IN HAMILTON 355

FRONTISPIECE

CANADA BREAD COMPANY'S NEW DANFORTH AVENUE PLANT, TORONTO 324

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



EXTERIOR VIEW

CANADA BREAD COMPANY'S BAKERY, DANFORTH AVENUE, TORONTO.

MCCORMICK COMPANY AND CHARLES S. COBB, ASSOCIATE ARCHITECTS AND ENGINEERS.

Canada Bread Company's Bakery, Toronto

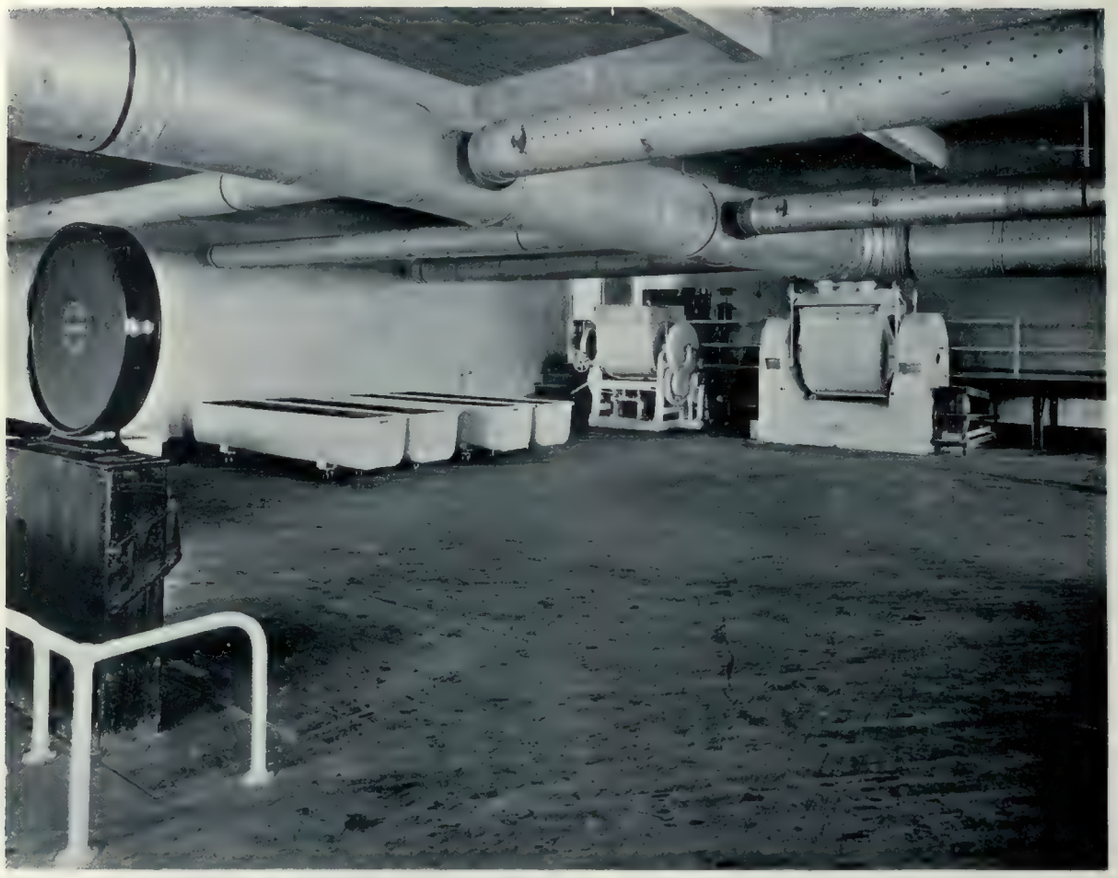
THIS building was erected to house a modern manufacturing plant, in which the sequence of production was the controlling influence in the placing of the different departments. The building is designed to make the process of bread manufacture, as far as possible, a mechanical operation with every modern means introduced to reduce the amount of manual labor required. In describing this plant, it might be well to follow the progress of the raw materials as received at the building, until same emerges in the finished product.

Flour and ingredients are received at the driveway on the east side of the building, and are first weighed on the large auto truck scale. The flour is carried to the rear of the building where the floursacks are elevated to the flour storage on the third floor by a continuous sack elevator. Other ingredients such as lard, salt, sugar, molasses, raisins and fruits, milk powders, malt extracts, yeast, etc. are also brought to the building through this driveway to an entrance which is accessible to the freight elevator. This elevator distributes materials either to the large ingredient storage room provided in the basement, or to the ingredient room on the third floor, directly accessible to the mixing platform. After the flour has been received in the flour storage, which is adequate for a considerable quantity, it is passed through a blending plant; thence it is conveyed mechanically to sifters. These two pieces of machinery are in the flour storage room.

Adjacent to the flour storage is the dough room which occupies the Danforth Avenue front on the third floor. At one end of this room is the mixing platform which is next to the ingredient room and adjacent to the flour storage. On this platform, flour and ingredients are introduced into the two electrically operated mixing machines, the flour being carried over from the sifting plant by a conveyor. Added to the flour are the yeast and other ingredients and also a charge of water. This water during the heated season of the summer is cooled by an adequate mechanical refrigeration plant adjacent to the dough room, which also supplies mechanical refrigeration for a yeast refrigerator. One of the mixers is also cooled by a water jacket connected to cold water tank. After the dough has been thoroughly mixed and kneeded in the mixers, same is emptied into troughs and allowed to raise for a number of hours.

BLENDING AND SIFTING PLANT IN FLOUR STORAGE, THIRD FLOOR

As proper humidity is an important element in the conditioning of the dough, a modern humidifying plant has also been installed in this room. This is supplied with fresh air from the roof which is washed and then forced into the room through a system of pipe distributors by an electric fan. All exterior windows in this room are provided with double sash for insul-

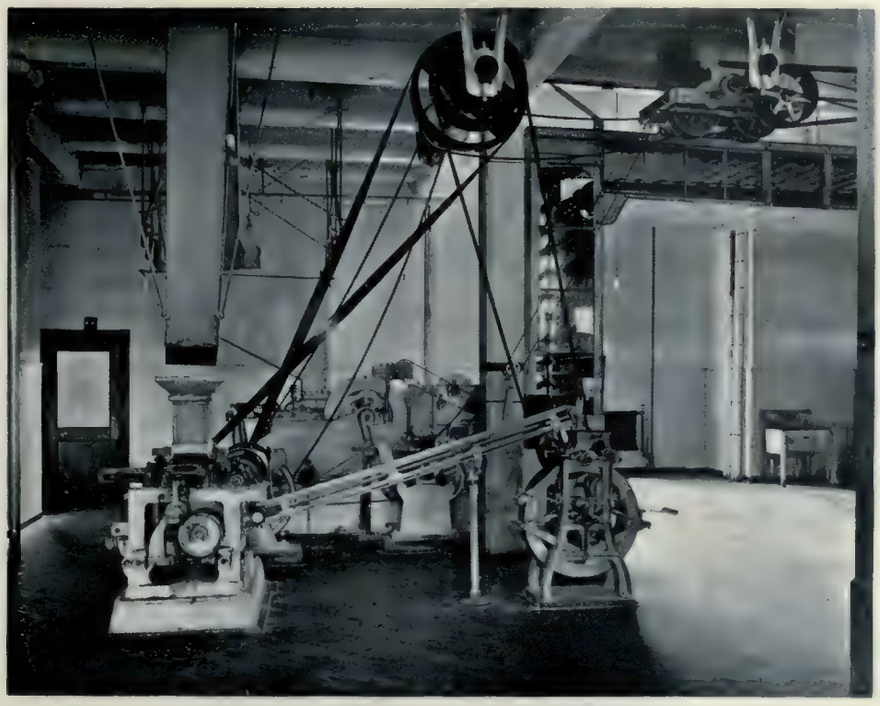


MIXING PLANT AND DOUGH ROOM, THIRD FLOOR

DOUGH ROOM, THIRD FLOOR, SHOWING HUMIDIFIER AND DISTRIBUTION FROM SAME.

CANADA BREAD COMPANY'S BAKERY, DANFORTH AVENUE, TORONTO.

MCCORMICK COMPANY AND CHARLES S. COBB, ASSOCIATE ARCHITECTS AND ENGINEERS.



DIVIDERS AND TRAVELLING PROOFER IN OVEN ROOM, SECOND FLOOR.

ation, as it is essential to maintain an even temperature here both winter and summer. A platform dial weigh scale is also an accessory to this room.

When the doughs have sufficiently raised, an operator cuts the content of each trough up in sections which are passed down a chute into the hoppers feeding the dividers on the second floor as shown in the illustration. In these machines the dough is automatically conveyed by a series of pockets arranged in belt form which is called a travelling proofer. From the travelling proofer the dough is automatically delivered to a shaper, and is placed by hand in the pans ready for the next process which is retention for a period of time in a closed, heated and humified compartment known as the steam proof box. This apparatus is adjacent to the dividers and the travelling oven. From the proof box the pans with dough which has by now risen to the proper extent, are ready for introduction in the receiving end of the travelling oven, which is clearly shown in the illustration.

This oven consists of a continuous motor driven belt of steel plates, and is approximately 100 ft. long. The speed of baking can be regulated from 20 minutes to one hour. A recording electrically operated thermometer is placed at receiving end, which gives temperatures at any point in the entire length of the oven. The capacity of this oven is 5,000 loaves per hour. It is equipped with gas and steam connections the gas being compressed by equipment mounted over the oven. At the delivery end of the oven is placed a belt bread conveyor, which carries the finished loaves from the oven down past same and by a series of spirals and other belts, through floor to the conveyor receiving table in the bread room on the ground floor of the Danforth Avenue front. From this belt table the bread is taken by hand to the racks for distribution to the delivery

TRAVELLING OVEN, SECOND FLOOR, SHOWING BREAD CONVEYOR.

BREAD ROOM, FIRST FLOOR, SHOWING DELIVERY END OF BREAD CONVEYOR.

OFFICES

CANADA BREAD COMPANY'S BAKERY, DANFORTH AVENUE, TORONTO.

MCCORMICK COMPANY AND CHARLES S. COBB, ASSOCIATE ABCHITECTS AND ENGINEERS.

waggons which are ready to receive same directly behind the bread room.

It has been found with conditions as they exist in Toronto at present, with a great many unpaved streets to deliver upon, that horse delivery has proved more satisfactory than motor distribution. A modern fireproof stable for forty horses, with elevator and feed supply, blacksmith's shop, harness room, etc. has therefore been provided at the rear of the property.

The construction of the building is of structural steel, fireproofed with reinforced concrete floors. The finished floors are of maple. The exterior is finished with a local red stock brick, the front on Danforth Avenue being simply trimmed with Indiana limestone. Ample office space with vault accommodation, drivers' room, toilet, locker and lunch room conveniences have been provided on the second floor. Lunch, locker and shower accommodations are also provided for the male staff on the third floor. Steam for heating and also connections to proofer and travelling oven, are provided by two 50 horse power horizontal tubular boilers in basement, to which is directly connected the coal storage area on east side of building under entrance driveway.

WAGON ROOM, FIRST FLOOR.

Land Tenure and Its Effects on Town Planning

By H. L. Seymour, A.M.E.I.C., Member of the Town Planning Institute of Canada.

Paper Read Before the Recent Montreal Town Planning Conference.

THE fundamental problems of town planning are essentially land problems. This is by no means an original statement, but it is a statement that cannot be over-stressed. The town planner is oppressed with evils of land speculation and the concomitant evil—the holding of valuable land out of use.

I want to speak particularly of land tenure, as it relates to city planning, but would first like to describe the effects of land tenure with respect to national and regional planning, and how the condition under which land is held effects land speculation and vacant land. From a study of the old Mosaic law, it would appear that every endeavour was made to secure, within the limits of the Hebrew commonwealth, to each family and to every generation, the equal right to the use of "the land which the Lord their God had given them," the family being regarded as the unit of the nation. Starting with an equal division of land to each family in the "Promised Land" the Mosaic law pro-

vided that once in every fifty years the original division was to be restored. It seems to have been also clearly understood that to hold land a requirement was that it should be put to use.

It is probably unnecessary to state that there are now no general statutes in Canada, the effect of which is to give to each family an equal share in the land, or which insist on land being put to use as a condition of holding it. It is interesting to note, however, that according to the recently proposed Jewish land settlement scheme for Palestine. land may be purchased and developed, left to descendents, but never sold. It is thus hoped to eliminate undesired speculation.

According to "Garden Cities and Town Planning" for August, 1921, there is in the desire of the Jewish nation to return to Palestine, the idea of reversion to an agricultural mode of life. The longing to return to simpler and healthier conditions has engendered the wish on the part of the colonists to acquire even in their towns, some of the beauty and closeness to Nature that is to be found in the country. They are inclined, therefore, to accept without doubt or question the ideas which the garden city movement has evolved.

The feudal system, in theory, was a well defined system for the tenure of land. All land was held from the king or the state, in tenancy. The overlord did, in theory, rent certain large areas of land from the king; the rent was paid in certain services, amongst these services being the administration of this land. The ordinary tenant rendered to the overlord his rent in the form of services and produce, receiving in return, protection, and the right to the use of his land. Under such a system, theoretically at least, the land was held under equitable conditions. Many of our legal terms in regard to land tenure are based on the feudal system.

Coming to Canada, itself, it is interesting to note that in Quebec, according to the first British constitution in 1774, all French laws affecting the tenure of real estate, were to be re-established, that is public lands were to be granted in fiefs and seigniories as prior to 1760 before the British dominion. But as a matter of fact in 1783 the Settlement of Canada began under the tenure of free and common soccage, the method of tenure under which lands are now generally granted and held in this country.

The criticism of settlement in Canada must be that we have allowed settlers to go practically wherever they wanted to in this country and then have tried to answer their demands for adequate transportation and the amenities of civilization. Further, we have allowed people to settle where we now know it to be impossible for settlement to be successful, as an instance, the Trent Watershed in Ontario. Surely we could have attached conditions to the holding of land that would have made big expenditures and waste of life impossible. The town planner's way is surely that of developing one area or district before another area or district is opened up for settlement. To protect the right of the individual the community must control community development. To allow a settler to go on land that will not support him or his family, means that eventually both the individual and the community are going to suffer for that evil.

Tenure of Land in Cities

We see many evils in our city development that the city planner is anxious to ameliorate. He desires to alter conditions that such evils will be impossible in future. How does the tenure of land affect the evils of congestion and the difficulties of making necessary improvements along town planning lines? Let us study this problem of land tenure in the light of the experiences of modern developments carried out under private or community auspices. Of these, Letchworth, the sixteen-year-old English Garden City is the outstanding example. A memorandum issued by the Garden City Company reads in part as follows:

> "Under these circumstances it is obvious that for the sake of the tenants themselves, as well as in order to secure the fulfilment of the objects of the company, it is desirable to apply the most equitable conditions of land tenure possible both in respect of public and private interest. This can only be accomplished if the company in the first place maintains the full control of the development of the town, and in the second place adopts the system of tenure which will secure, as far as possible, under the established laws and customs of the country, that the increase in the value of land shall benefit those who create it. As the greater part of this increased value is due to the social activities of the people as a whole (i.e., in their collective capacity) it is in this capacity that they should receive the benefit and not as private individuals."

Recently in the "American City" and "Garden Cities and Town Planning" there have been articles by Mr. C. Montoliu of Acadia University, Nova Scotia, in regard to town planning schemes for Fairhope. Fairhope, we are told, is the outgrowth of a plan conceived about twenty-seven years ago by a small group of single-taxers at Des Moines, Ia., followed two years later by the actual move to put the plan into execution, when the first party landed as pilgrims on the east shore of Mobile Bay on November 15th, 1894. The holdings of the colonists consist of nearly 4,000 acres.

The colony was incorporated under the laws of Alabama in 1904 under the name "Fairhope Single Tax Corporation." The Corporation is not organized for profit and has no stock,

pays no dividends and divides no profits. It exists solely for the purpose of demonstrating, so far as may be done under existing laws, the wisdom of taxing *land values only* for public revenues; but having no power of taxation the principle is applied by leasing for 99 years instead of selling its lands, collecting full annual use-value as rent and using this rent to pay not only the State taxes upon the land, but also the taxes upon the improvements and personal property of all lease holders. Any balance is then used for public improvements. Among institutions of Fairhope owned by the colony and municipality are the water-works, light and power plant, telephone and street railway line with 11½ miles of track, bath houses, wharf and a public library with more than 4,000 volumes. Privately owned are an ice plant, creamery, saw and planing mill, cabinet shop, bank, weekly newspaper, garages and all kinds of merchandise.

Civic Ownership of Land in St. John, N. B.

I am fortunate in being able to give you a short statement of civic ownership of land as it obtains in St. John, New Brunswick, which shows some of the possible, although unnecessary, disadvantages of civic ownership. While engaged in town planning work with the Dominion Government, I had the pleasure of coming in contact with Mr. W. F. Burditt, Chairman of the Town Planning Commission of St. John, N.B., and he has been good enough to give me the following:

"With regard to civic ownership of land: The City of St. John is exceptionally favored in this respect but does not seem to much appreciate its privileges. Near the end of the 18th Century when the city was incorporated by Royal Charter, or shortly thereafter, it received a grant from the Crown of 1,000 acres of land. ostensibly to enable it to provide for schools and similar public services. A portion of this land was within the city limits as then defined, but the greater portion of it was, and still is, outside the city boundaries; though by extension of the boundaries some of the land which was outside at the time the grant was made is now within. The possession of this land by the city seems to have been regarded by successive City Councils rather as a burden than a benefit and a source of expense rather than revenue. The reason for this is that many years ago there was adopted a system of leasing the land in larger or smaller lots on what are termed "renewable leases." This form of lease is, so far as I know, peculiar to this city, its distinguishing characteristic being that it prevents the owner from obtaining any advantage from the unearned increment in the value of the land, except by purchasing the improvements which the tenant may have placed upon it. That is to say, the owner, upon the expiration of the lease, must either renew it at the same rental or else pay for improvements. The consequence, of course, is that the tenant will always renew, if there is any advantage to him in doing so, and the only alternative the City has is to purchase old buildings at a high valuation, for although provision is made for arbitration as to the value of improvements, arbitrations of that kind usually favor the individual rather than the Corporation. As a result of this system, the city has from time to time acquired the ownership of many old houses, mostly occupied by a poor class of tenants who do not always pay rents promptly. The cost of maintenance and repairs is found to be very heavy, often exceeding the rental and in short the city as a landlord in St. John, has proved to be a failure. I need not enter into the reasons for this, most of them will no doubt be obvious to you without stating, but the consequence is that it has seemingly become the settled policy of the city to part with its real estate by outright sale whenever it has the opportunity of doing so, and a large part of the land which it acquired by Royal Charter has within recent years passed into the hands of private owners. Personally, I have reprehended this policy and have on different occasions addressed communications to the press advising against it; but public opinion generally is in favor of private ownership and commends the city's policy. The opposition of the Board of Trade is probably the only thing that prevented a short time ago, the alienation of a valuable piece of harbor front property owned by the city.

When it is pointed out that all this property will some day yield a large revenue and that the people as a whole should benefit by the unearned increment instead of private individuals, it is argued that the money for which it may be sold if invested at compound interest, would yield in the same time an even greater return. Whether or not that is a correct view is difficult to determine. It would depend largely upon circumstances and the rate at which real property increased in value; the rate at which it has increased here in the past is certainly not such as to afford very strong inducement to hold, but it may be said that in practice when land is sold, the proceeds are not invested at compound interest, but used to meet current expenditure, and having eaten our cake we cannot have it too.

Another argument which I omitted to mention in favor of disposing of the city's lands, is that when sold they become a source of revenue through the taxes collected from individual owners.

Contrary to these arguments, is of course, the experience of many land-owning cities—particularly those in Germany—and what might have been the experience of some American cities — New York for instance—had they held on to their real estate. (1) I have seen it stated that the City of New York, notwithstanding its enormous expenditure, might now be a tax-free city had it retained all the harbor front and other property which it formerly owned; this calculation being based upon the revenues actually obtained from the Astor properties.

I find in a book by D. F. Wilcox, "The American City a Problem in Democracy" (2) the following:—

'The city of New York by its early charters, was granted the municipal ownership of the ferries, markets, lands under water for four hundred feet about the island, and all unappropriated lands on the island to low-water mark. The revenues from these municipal properties usually paid the expenses of the government in the early days, but gradually the city fell into the policy of selling its lands to meet extraordinary demands upon its treasury, and this policy was not reversed until practically the whole of Manhattan Island, an almost priceless heritage from the fathers had become the property of individuals, and the enormous wealth created by the growth of the city was not available for the public improvements peculiarly necessary in New York to prevent intolerable congestion.'

The subject as you intimate, is closely related to Town Planning, besides being of paramount importance in connection with Civic Economics, and I regret that I am unable to give you from the experience of this City any facts or figures in support of the theory, which I thoroughly believe in, that a city should so far as possible own the land upon which it is built and that especially when any public works are undertaken from which adjacent property will especially benefit—as for instance, the harbor improvements at Toronto and the Courtenay Bay improvements at St. John—the city or the municipality should adopt measures by land purchase or otherwise that will secure to it a large measure of the increased value of land resulting from the expenditure of public money on such improvements.

---

(1) Frederic C. Howe in his book entitled "European Cities at Work" in the chapter relating to Town Planning and City Building, makes particular reference to the acquisition and owning of land by German cities see particularly pages 75, 76, 80, 98, 99 and 100.

(2) See Mr. E Dana Durand's "The Finances of New York City" pages 18, 19, 226 and 227.

Our Town Planning Scheme has at last got to the stage where we are simply waiting the completion at the City Hall of the necessary maps to accompany the application for approval."

Under civic ownership lands may be leased, as in the case of the city of St. Johns, New Brunswick, under terms that are not favourable to the community, but as a rule it may be stated that civic improvements can be more readily carried out under lease-holds than under private ownership. In the latter case of private ownership the question to city planners is as to the degree of public control over private property. In Europe there have been cities such as Vienna in which a new street could not be constructed or an old one widened unless the owner of the land required, was willing to sell it.

Town planning legislation in Europe in the sixties of last century, probably because of such conditions, dealt largely with the expropriation of land to facilitate public improvements. In Germany the state has exercised autocratic control in such matters. Mr. Reginald Dan, appointed Town Planning Adviser to the Madras government in India, in his recent tour of America, told us in Toronto that in civic improvement in German cities he knew of cases where 50 per cent of the land was taken by the city in making improvements. In Canada the cities have, of course, the right of expropriation and may, in some instances, buy for re-sale more land than is necessary for the improvement, but in many instances the cost involved seems to prohibit many changes made really necessary by the lack of attention to planning in the years past.

Mr. Nelson P. Lewis, Chief Engineer of the Board of Estimate and Apportionment of New York City, Member of the American Society of Civil Engineers and National Conference on City Planning in his book "Planning of the Modern City" under chapter "Financing a City Plan" states that the cost of civic improvements is met:—

1. By direct assessment upon the property which would be benefited by each particular improvement.

2. By making the expenses a general city charge raised:—

(*a*) By Annual Tax levy.

(*b*) By borrowing and making repayment by annual tax levy over the terms of years.

Mr. Lewis, by the way, draws attention to the evils of long term bonds which should, of course, in no case exceed the life of the improvement. Mr. Lewis states:—

In the more fundamental work of city planning, where unoccupied territory is being developed, the property will not have been assessed for improvements, and consequently the acquisition and construction of new streets can properly be assessed upon the adjoining or neighbouring property according to benefit, such benefit representing the entire cost in the case of local streets and a portion of the cost in the case of thoroughfares of more than local or even of metropolitan importance. One principle should invariably be recognized: namely, where there is local benefit there should be local assessment. There can be no improvement which has been intelligently planned and executed which will not result in some local benefit, and it follows that there should always be some local assessment. No improvement, however small or large, will be of equal benefit to the entire city, and to distribute the burden of paying for it over the whole city according to taxable values is unfair in that it is not placed according to benefit. The owners of property in the immediate vicinity are freqeuently enriched at the expense of those whose holdings are entirely outside the district directly affected.

Of Mr. Lewis' remarks I would emphasize the following:—

(A) There can be no improvement which has been intelligently planned and executed which will not result in some local benefit.

(B) One principle should invariably be recognized namely where there is local benefit there should be local assessment.

In generalizing these statements of Mr. Lewis there seems to be no reason why the word local should not be deleted. It is submitted,

(C) That local or any benefit due to an improvement can be fairly determined by the increase of land values resulting from such improvement.

Upon consideration and some study of specific cases I am personally convinced of the truth of the principle:—

(D) Any civic improvement which has been intelligently planned and executed will result in benefit i.e. an increase in land value due to such improvement at least equal to, and generally more than sufficient to meet the cost of that improvement.

Mr. Lewis states in this connection as follows:—

The City Club of New York several years ago showed that as a result of the building of the first rapid-transit subway in New York, the actual land values in those portions of upper Manhattan and the Bronx which were most directly affected were within seven years increased $80,500,000 above the normal increase for that period. The cost of that part of the subway passing through the districts where this rise in values took place was about $13,000,000, while the cost of the entire subway from the Battery north was $43,000,000. It is quite evident that if the $13,000,000 which was spent on that part of the subway traversing the district so notably benefited has been assessed directly upon the property, its owners would still have netted a neat profit of some $67,500,000 while, had the cost of the entire subway been assessed upon the same limited district, the net profit to the land owners would have been $37,500,000.

Assuming the cost of this improvement at 13 million and the increase in land values is 80 million, we find that a tax of 2½ per cent on

the increased land values only would in ten years pay for the improvement. In Toronto the Bloor Street Viaduct was built some years ago opening up a territory which had been long ripe for development. As the cost was borne by the city at large, it took a long time to impress sufficient voters with the importance of such improvement, but let us see what has happened. I must apologize for not getting exact figures, one reason being that such are as not yet, I understand, available; but in round figures the cost was about two million and I am informed that the increase in land values in the area mostly affected by such improvement was around six million dollars. If this be so, we find that a 3 per cent. tax on the increased land values would have paid for the improvement in twenty years, the life of the improvement being, of course, considerably more than twenty years. Many other examples might be given such as the widening of St. Clair Avenue in Toronto, where, if I remember rightly, abutting owners pay for ten years a tax of $6 per foot front and where general property increase has been over $100 per foot; but I believe it is not necessary to give any further examples, you can all cite examples from your own experience.

Upon consideration it appeals to me as almost axiomatic that improvements such as those named (in fact all needed improvements) must result in an increase in land values sufficient to meet the cost of that improvement. Surely then land should be held under such conditions that the increase in land values can be taken for such improvement. Civic ownership with leasehold is a method that answers this requirement. In several provinces of Canada where town planning legislation has been enacted provision is made for recovery of one half the increment in land values due to a town planning scheme. In Saskatchewan, I understand this amount is to be collected in ten equal annual payments.

Under the present method of assessment and tax levying an average city probably collects about one half the economic rent of the land, that is to say, about one half the amount that might be collected if all the property were owned by the city. If land were taxed to its full rental value ownerships might still be vested in the individual, but from principle (D) already mentioned, the cost of all improvements intelligently planned and executed would automatically be met. The improvement increases the land value, and say six per cent which may be taken as a fair rental value under our present methods, would from the example shown easily meet the cost of any improvement. A permanent six per cent tax on land values as at present estimated would permit of the elimination of other sources of revenue such as taxes on improvement, income and business. I am aware that a difference of opinion exists as to sociological and other advantages, when we have carried our conclusions to the point I have reached. I would like particularly, however, to point out the relationship between civic or public ownership with leaseholds, and private ownership with a full annual rental value return to the civic government. In either case the city would draw the same revenue, would benefit directly in all increased land values due to all public improvements. In the second case, however, the title to land would be vested in the individual owner and not in the city. Might I mention in closing that in Ontario the law passed in 1920 and amended in 1921 empowers municipalities to gradually remove all taxes on improvements, income and business and to derive eventually local revenue from a tax on the value of land only.

Lack of comprehensive city planning in our western cities, for reasons which I have not time to explain, has apparently cast some discredit on the method of taxation of land values only. I am convinced the fault was in lack of planning and in legislation that permitted huge arrears of taxes.

New Device For Crane Operation

In the operation of large cranes used in building construction or for dock work it is generally necessary to have two men engaged, one working the controllers, and the other stationed at some convenient point to signal to the first. With the aid of a device invented in Great Britain it is possible to dispense with one of these men. The device consists of a portable electric controller which can be slung over a man's shoulder and can be supported by means of a long pointed leg. The controller is connected by means of a strong flexible cable with special controlled gear operating the crane motors. The user has merely to press certain buttons on the controller to make the crane go through all its usual evolutions. Thus the operator can stand at any point convenient for observation or he can walk about from one point to another so as to secure a complete supervision of the working of the crane. This invention should be of the greatest assistance in saving labour in docks and on construction work generally.

SKETCH MODEL OF WAR MEMORIAL DESIGNED BY WALTER S. ALLWARD, TORONTO SCULPTOR, TO BE BUILT ON HILL 62, OVERLOOKING THE YPRES SALIENT.

Description:—At the base of the strong impregnable walls of defence are the Defenders, one group showing the breaking of the Sword, the other the Sympathy of the Canadians for the Helpless. Above these are the mouths of the guns covered with olive and laurels. On the wall stands an heroic figure of Canada brooding over the graves of her valiant dead; below is suggested a grave with a helmet, laurels, etc. Behind her stands two pylons symbolizing the two forces—Canadians and French—while between, at the base of these is the Spirit of Sacrifice who, giving all, throws the torch to his comrade. Looking up they see the figures of Peace, Justice, Truth and Knowledge, etc., for which they fought, chanting a hymn of Peace. Around these figures are the shields of Britain, Canada and France. On the outside of the pylons is the Cross.

SELECTED BY THE CANADIAN BATTLEFIELDS MEMORIALS COMMISSION AS THE DOMINANT FEATURE OF SEVERAL BATTLEFIELD MEMORIALS TO BE ERECTED BY THE CANADIAN GOVERNMENT IN BELGIUM AND FRANCE.

SKETCH MODEL OF DESIGN BY MR. F. CHAPMAN CLEMENSHA, REGINA, WHICH HAS BEEN SELECTED BY THE CANADIAN BATTLEFIELD MEMORIALS COMMISSION.

THE INTENTION IS TO USE THIS DESIGN FOR MONUMENTS TO BE ERECTED AT PASSCHENDALE, ST. JULIEN, VIMY RIDGE, BOURLON WOOD, COURCELETTE AND HOSPITAL WOODS.

Walter S. Allward, Toronto sculptor, and F. Chapman Clemensha, a Regina architect, are the successful competitors in the Canadian Battlefields Memorials Competition for designs for the memorials to be erected on the Canadian battlefield in France and Belgium.

The award was recently made public following confirmation by the Cabinet Council of the recommendations of the Board of Assessors.

Mr. Allward's design calls for a magnificent monument of not only great size and dignity, but strikingly impressive in its symbolic character. The monument will be 225 feet long and 125 feet high and will be seen for many miles around.

The design of Mr. Clemensha will be used for monuments to be erected at Passchendale, St. Julien, Vimy Ridge, Dury Crossroads, Bourbon Woods, Courcelette and Hospital lWoods.

The assessors were Frank Darling, Royal Architectural Institute of Canada; Prof, C. H. Reilly, Royal Institute of British Architects; and Paul P. Cret, Society of Architects of France. Mr. Percy E. Nobbs, Montreal, acted in the capacity of professional advisor to the Commission.

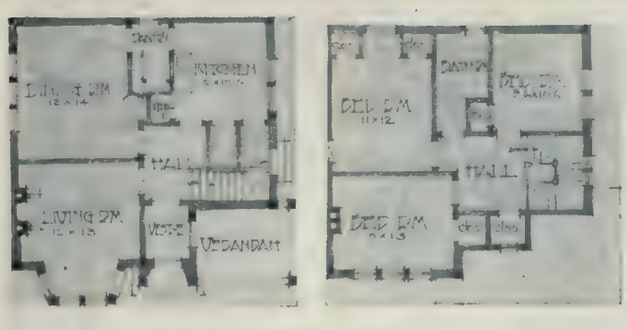
The conditions of the competition, together with the seventeen designs selected in the first stage of the competition, were published in the June issue of Construction.

HOUSES ON LINCOLN SQUARE

VIEW AT INTERSECTION

LANSDOWNE PARK HOUSING DEVELOPMENT, BRANTFORD, ONT.

SCOTT & WARDELL, ARCHITECTS



PLAN OF END HOUSES (LEFT)

PLAN OF GAMBREL ROOF HOUSES

Lansdowne Park Estate, Brantford, Ontario

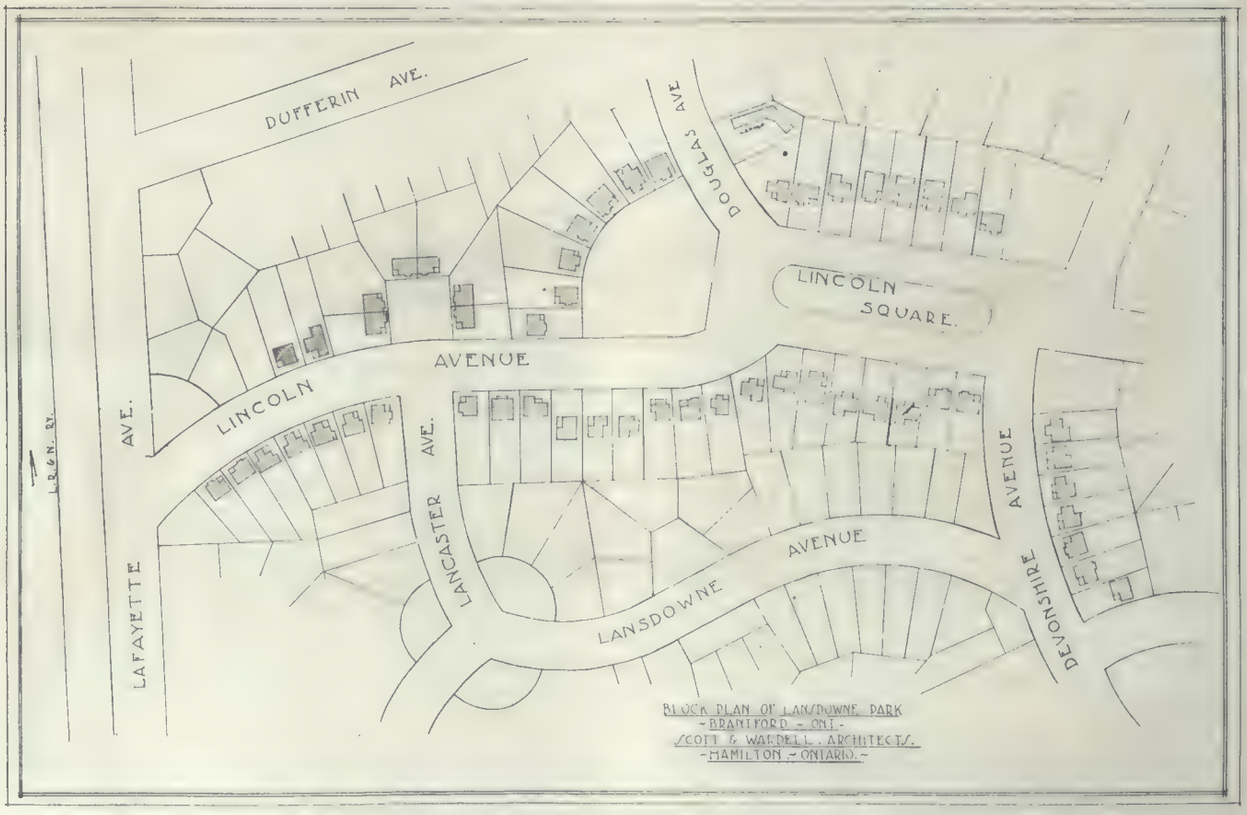
THE acute housing shortage which existed in 1918 and which still exists to a large extent in many Canadian industrial centres has resulted in considerable thought and study being given to the question of providing comfortable accommodation for the working classes and small investors. Through the efforts which have been put forth we are at least beginning to observe some of the advantages which result from intelligent planning, as well as some of the amenities and benefits which are designed to contribute to the domestic contentment of the industrial worker.

Excluding several of the new industrial towns which are being established under ideal supervisory conditions, and the re-housing development at Halifax, which may be regarded as a major undertaking, the work so far carried out can be divided into three classes: (1). Houses erected by individuals through government aid; (2) co-operative effort on the part of owners as seen in the Lindenlea Estate in Ottawa; and (3) the housing scheme which has been developed by both land holding companies and manufacturers to meet the pressing need for housing conditions. Not only is it becoming more generally recognized that a direct relationship exists between a high standard of living condition and industrial production, but in the matter of housing itself, it must be said that the efforts of Canada compare very favorably with those of other countries.

Lansdowne Park at Brantford comes under the last named heading and represents a development which had its inception in the closing year of the war when the Dominion Steel Company, finding the housing of a large number of mechanics an impossible problem, decided upon the construction of a number of workmen's dwellings as the only solution. For this purpose some thirty-three acres of land were acquired in the vicinity of the company's plant, which is located on the outskirts of the city.

This land was totally undeveloped property and necessitated such improvements as grading, sewers, roadways, sidewalks, as well as the planting of shrubs and trees to give the houses

HOUSES ON LINCOLN SQUARE



LANDSDOWNE PARK HOUSING DEVELOPMENT, BRANTFORD, ONT.

SCOTT AND WARDELL, ARCHITECTS

H. B. AND L. A. DUNINGTON-GRUBB, LANDSCAPE ARCHITECTS

an attractive setting. While within convenient walking distance to the company's plant the latter is sufficiently removed from the residential area so as to in no way intrude on its domestic character.

Operations were started on the property in 1918 and the project to a large extent was completed during the following year. Out of some 250 residential sites arranged on the property, fifty houses have so far been built.

The central motive of the scheme is the village green or square around which the houses are placed. A definite effort has been made to arrange the houses in groups and courts for the sake of privacy, seclusion and architectural effect. A glance at the ground plan will show that no through traffic has been provided, but that a system of curvilinear streets connect with the main roads of travel at the boundary of the property.

In all, ten types of houses of different sizes and designs, have been developed, all of a quite harmonious English character. The construction and layout of these houses correspond in every particular to the Ontario Housing Act, excepting in some cases the rooms are larger than the minimum set down in the Act. The cellar in each case is 7 ft., the first floor, 8 ft. 6 inches, and the second floor 8 feet clear. The foundations are concrete, 12 inches thick, with 8 inch hollow tile walls above covered with stucco. Besides variety in design, four kinds of stucco have been used in order to avoid a monotone effect in the exterior treatment of the various houses. The roofs are covered with B. C. cedar shingles stained.

The interior walls are finished with a stucco plaster and tinted, the floors being of B. C. fir, stained and varnished. B. C. fir is also used for the interior doors and trim, which have a natural finish. The service equipment consists of three piece bath room fixtures, combinatiion sink and tub in kitchen, with electric stove and electric lighting. The heating of the dwellings is done by hot air.

Owing to the variation in design and treatment, it is difficult to state definitely the cost of each particular house, but the average would approximate $3,700 exclusive of land and local improvements. As the development was carried out during the period representing the highest peak in prices, the cost will probably provide no useful indication of either immediate or future cost in industrial housing.

LANSDOWNE PARK HOUSING DEVELOPMENT, BRANTFORD, ONT.

SCOTT AND WARDELL, ARCHITECTS

FIRST FLOOR PLAN

UPPER FLOOR PLAN

The planting of the scheme has not as yet been brought to a full state of development but sufficient has been accomplished to indicate how successfully the project has been carried out. The architects were Messrs. Scott & Wardell, of Hamilton, Ont., and the landscape architects, the well known firm of H. B. and L. A. Dunington-Grubb, of Toronto. Messrs. Scott and Wardell, the architects, are at present completing plans for a similar housing scheme at Stratford, Ont., on which operations will start in the spring.

GENERAL VIEW OF LINCOLN SQUARE.

GAMBREL ROOF HOUSES

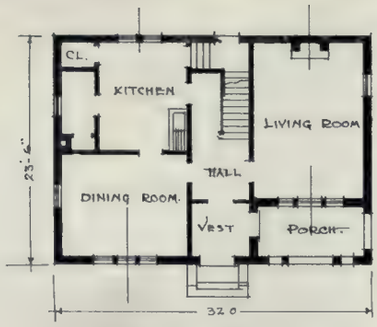
VIEW SHOWING COMMUNITY GARAGE

LANSDOWNE PARK HOUSING DEVELOPMENT, BRANTFORD, ONT.

SCOTT AND WARDELL, ARCHITECTS

H. B. AND L. A. DUNINGTON-GRUBB, LANDSCAPE, ARCHITECTS

HOUSE OF TWIN GABLE TYPE



GROUND FLOOR PLAN

UPPER FLOOR PLAN

SCOTT AND WARDELL, ARCHITECTS

LANSDOWNE PARK HOUSING DEVELOPMENT, BRANTFORD, ONT.

Association of Scientists to Meet in Toronto

The seventy-fourth meeting of the American Association for the Advancement of Science will be held at Toronto, December 27-31, by invitation of the Toronto University and of the Royal Canadian Institute. While it is not expected that the Toronto meeting will attain the magnitude and complexity of the four-yearly meetings held in rotation at Chicago, Washington and New York, and particularly the recent meeting held at Chicago, it is nevertheless certain to be most satisfactory in many ways. The program will be simpler, with fewer serious conflicts. It will also excel in opportunities for personal and social contact among those in attendance, a very desirable and valuable feature of the association meetings that is necessarily thrown in the background at the large four-yearly meetings.

The meeting which will bring together many affiliated and associated scientific societies for the reading of papers and scientific discussions, will be the first gathering of its kind in Toronto since 1899 when the association had a membership of approximately two thousand as compared with twelve thousand at the present time. It is therefore predicted that the event will be exceptionally interesting and inspiring on account of its international character. More Canadian men of science will attend than is usual at meetings held south of the international boundary, and the scientific workers of the two great English speaking nations of North America will have opportunities at the Toronto meeting for becoming better acquainted than they now are, and for strengthening the bonds of mutual understanding and of personal and international friendship. Arrangements are in progress whereby, it is hoped, several British scientists may be present to give addresses at the various sessions.

"Architectural Education"

By Adrian Berrington, Associate Professor in Architecture, University of Toronto.

Address delivered before the recent R.A.I.C. and O.A.A. Joint Convention at Toronto.

I HAVE nothing very startling or new to say on this subject of education. It is not easy for one immersed in the actual business. The man who is doing the work is often reluctant to talk about it, but my invitation here was such that I was quite unable to refuse.

An interest in education is natural at this time in view of the proposed legislation. If the architects are going to ask the community to allow their profession to become what is called "close," the community, in its turn has the right to make very certain that the architects are competent. Hence the necessity of a high standard of architectural education.

To start with I began thinking of what this business of architecture consists. It is a complicated affair and not so simple as other professions; I think it is a science, an art, a profession and a business all combined, and the architect as a unit, in himself or in his firm, has to fill that considerable bill. Note the order in which I place these qualifications: science, art, profession and business.

I set myself to enquire how education, as carried on in a school can deal with these four sides which an architect ought to possess and I am going to take the last one first because it is the part with which formal education has practically nothing to do. There is almost nothing that can be taught in school, of any particular value in the way of business. Everybody knows that that has to be picked up and learned in business. There can be a little formal teaching on the principles of finance and kindred matters but it cannot amount to very much and cannot be given much space in a crowded curriculum.

In dealing with the professional code and character, the school comes out more strongly. True, formal teaching in these matters cannot again be of any considerable value, but what can be of value are the various activities in which the student at the university takes part. He learns to play the game and to take a beating without complaining and he learns what is due between man and man, not because honesty is the best policy but because it is right.

I come now to the second quality, which I have called art and imagination. It is a difficult matter to deal with because here again the school cannot do very much. (It almost seems to me that I am confining myself to telling you what the school cannot do). The school cannot bring out imagination if there is no imagination present; it may provide ground upon which a certain measure of imagination may grow. My own experience in Canada is that imagination is a very timid plant indeed and does not show itself as readily as it should in the student who is free, at any rate while he is in school, to be as willful and as imaginative as he pleases.

I come now to the part where the school really and naturally is strong; that is to say the part I have labelled science or knowledge, this being what the school can definitely teach and definitely does teach. To a certain extent general education is carried on after matriculation. The student can be instructed and is instructed in general scientific principles and he gets a general idea of the scientific principles in various sciences. He gets instruction in the application of that science, such as it is and as much as he gets of it, to structure; that is to say his scientific teaching is bent and molded towards his future work. As with the miner, as with the engineer, as with the chemist and as with all other scientists he begins at the university to specialize and he devotes himself to the application of scientific principles to the matter of construction. That is a thing definitely within the sphere of the school. I do not say the school can carry a man the whole way and make him a complete structural architect in the short term at its disposal but it can and does begin to lay down a theoretic basis for further practice. Then it has to take the student into an entirely different world and give him some knowledge of the allied arts and the history of these arts in the past. A curriculum is one long fight between the various people who can tell you what an architect must know and who think he should know all about their one particular subject or he cannot possibly be an architect.

The knowledge of architectural forms is one of the things which a school can impart. It is not a matter of art, it is a matter of science, it is a matter of definite knowledge, of knowing the orders of architecture, of knowing your types of joinery and kindred things; definitely knowing whole series and sets of architectural forms. These are the things things that the school can do. Then there are the fundamental principles of planning. Every architect will admit that a good plan is the basis of a sound design and yet you see around

so very, very few good plans, strangely few, whether it be a small house or a big apartment or an hotel. The plans we see in ordinary modern life that are really good, are very few. Planning is part of the training of a student on which we lay very strong emphasis. I cannot speak from actuel experience of other schools, but I would like to generalize so far as to say that a school is good or bad in so far as it is really successful in teaching the science of straightforward planning. That I think is the most important thing with which a school can and does deal.

How do the schools attempt to handle the aspects I have named? Insistence on a standard of general education I think will be found to be in direct ratio to the standing of the school. If an architectural school is strong it can insist on a much higher general education than if the school is weak. A school that is weak is apt to appeal on baser grounds, such as the giving of instruction which will permit the student to earn money quickly. A school which is strong can insist that an architect has to be first of all an educated man, a man who can meet all others on terms of equality. It is not a matter of merely formal education and passing an examination with a certain percentage of marks, it is a matter of standing. I do not want to say anything that may seem undemocratic but we all know that a man who has the habit of society will find his part much smoother than if he is ever so clever and nothing more. Speaking of that, I remember an architect who has enjoyed some of the highest honors possible. A friend asked him how he began his enormous practice and he said, "I bought two dress-suits" and I believe that is true.

As to the variations between the different schools, we have recently made an investigation of the various schools, Canadian and American chiefly. We did not bother much about the schools on the other side of the Atlantic. I happened to have had some experience in the schools in England and I found that the differences between Toronto and my own first school, Liverpool, are negligible. The main difference being that the school in Liverpool springs out of the Arts faculty there and here it springs out of the School of Applied Science. Naturally the Liverpool school had a strong cultural bias and the school at Toronto has what they call a scientific bias, but the schools are very much the same. It is actually the standard that matters and not the thing that is printed in the university calendar.

There is another aspect of the necessary education of a student and that is travel. Here I find that the necessity of travel is by no means so generally admitted as it is in England. In England the student can take a week-end in France and if he likes he can go for a week to Italy and it is quite easy for him to go and enjoy access to the best work that is the foundation of our modern work, in Italy and in France. He can also travel about England where there are many examples of fine work of the past. But in this country, if a student only goes to some of the States, it means a very expensive tour. I do not know what can be done to remedy what is a real defect in the education of a young architect in Toronto. How to get the money necessary to enable these fellows to get around and see the world a bit before they settle down in an office? In the Middle Ages, when the architect was apprenticed, he was assisted in travelling and he was sent on from one chapter of masons to another with a letter of recommendation, (travelling in those days being simply a matter of going afoot) and in that way the student managed to get around and see a great deal of work and meet the best men in the profession, in all the various cities of Christendom. It seems to me that here there is a great lack and a real need. I think it would be a good plan if the architects here could get some of their rich clients to found a travelling scholarship. I do not think it is too much to ask, it is being done in other countries and it should be possible here.

Another point is that the student should have actual practice in an office before he sets out for himself. The theory of a long vacation in the School of Applied Science is that the engineer and the architect shall utilize, at least three of the four and a half months of that vacation, in working on a job or in the office of some architect or engineer. In the case of engineers I believe it is a simple thing, and in the case of architects it worked out fairly well, but not, as it should, to 100% efficiency. I questioned the boys who returned this Fall as to what they had been doing in the summer and I found that several had not been doing architectural work. The reason was, of course, that there was not very much architectural work to be done, on the one hand, and that the student was hard up, he had to earn money somehow, in order to come back this year and he took the first job he could. Some means should be found by which every student can put in three months of his vacation in an architect's office. The second year man is more useful than the first year man in an office and secures a job more readily. A third year man secures a job quite readily and the fourth year man, I think, is pretty eagerly snapped up. The trouble is with the first year man and it is on his behalf that I would like to appeal

to this meeting. I do not know whether a committee could be appointed to deal with the matter but I would like to appeal to the Ontario Association, on behalf of the Toronto student, to see if some arrangement can be made by which every student, unless he is a congenital idiot, can be found a place in an office for three months in the summer.

VIEW SHOWING TEETH MARKS OF STEAM SHOVEL INDICATING TOUGH NATURE OF FOUNDATION CLAY.

POURING OF FOUNDATION WALLS PRIOR TO ERECTION OF STEEL WORK.

PROGRESS VIEWS OF THE NEW PRINCE EDWARD HOTEL, WINDSOR, ONT.

ESENWEIN & JOHNSON, WATT & BLACKWELL AND A. P. McPHAIL, ASSOCIATED ARCHITECTS.

Structural Features of the Prince Edward Hotel, Windsor, Ontario

By R. E. W. Hagarty, Consulting Engineer, Toronto.

THE most difficult problem an architect has to solve in planning a building is probably that of satisfying his client. The requirements of the average prospective builder are usually indicated to the architect somewhat in the negative, that is to say, he is generally provided with a clear understanding of many things which must be avoided, and all too often with extremely vague and limited suggestions as to what will actually be required. When the architect's preliminary studies have been completed, the criticisms may even involve, in many cases, complete revision of plans, several times before the general acceptance is secured. Even during construction, changes, sometimes of a most fundamental nature, may be asked and these are the difficulties with which every practising architect is familiar.

Next in importance of the architect's problems, is probably that of selecting a suitable structural design. Depending on this to a large extent is the factor of economy, which tells its story when tenders are received. On account of the many different varieties of construction which may be applied to the modern building, and the complexity of the architectural and economic conditions surrounding each, a thorough investigation of the structural design, especially for a large building, must be made.

These elements apply in particular to the construction of a modern hotel, particularly on account of the great variety in the types of the rooms for the various service departments, and partly on account of the very extensive mechanical and electrical equipment in a structure of this type. The structural design for the Prince Edward Hotel, at Windsor, had to be investigated from many angles as regards the type of framework, the floor system, and in this particular case, with special regard to foundations.

PROGRESS VIEW (AUGUST 16) SHOWING STEEL WORK WELL UNDER WAY.

Structural Steel Framework

A structural steel frame was ultimately decided upon in view of the speed with which it could be erected, and also on account of the minimum size of the columns afforded by steel. A system of rapid construction meant an actual financial asset in completing the building in as short a space of time as possible in order to reap the benefit of the operating revenue from which the interest charges on the investment must be obtained.

On account of the mechanical equipment, especially in the bath-room sections of the building, it was highly desirable to make use of every inch of space, and, therefore, the selection of the smallest possible type of columns, consistent with stability was obvious.

The spandrel wall consisted of four inches of face brick, backed with eight inch interlocking tile. The reduction in the weight over the

ERECTING FOUR FLOORS OF STEEL AT ONE LIFT

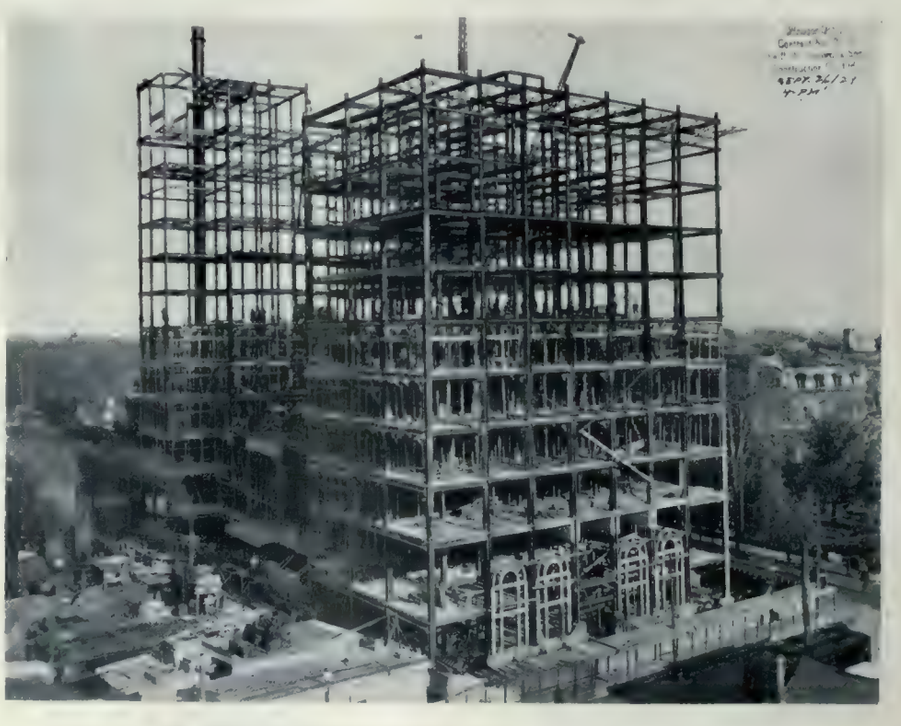
solid brick wall meant considerably less structural steel.

The floor framing of the structural steel consisted mainly of twelve inch I beams framing directly into the columns, which were arranged in the architectural lay-out so that they would coincide, as far as possible, with the partition lines. This means a very considerable economy in the structural steel, because beams can be arranged in partitions without framing into spandrel beams. Thus it is only necessary for the spandrel beams to be sufficiently strong to carry the wall, which consisted generally of seven inch to fifteen pound I beams with eight inch by one-quarter inch plates on the top of the beams; the edge of the plate being two inches from the face of the wall and the centre line of the I-beams seven and one-half inches from the face of the wall.

In order to provide for the additional three floors for which the building is designed, all steel beams above the main roof elevation which do not occur at the level of these future floors, have bolted connections and provision has been made on the columns to carry these beams when the other floors are added.

A suspended ceiling is used over the entire sixth typical floor. This consists of four inch at five and one-quarter lb. channels spaced four feet back to back, and hung by five-eights inch round rod hangers, spaced approximately six feet apart. The ceiling is fastened to the channels which are designed of sufficient strength to carry plank runways for use in connection with the pipe space which occurs between the suspended ceiling and the roof, a distance of six feet six inches. The columns are built up sections consisting of angles and plates with flange plates added for the heavier columns, the columns being spliced every other floor.

In erecting the steel work, the framing was erected four floors at one lift, after the first



VIEW SHOWING PROGRESS ON STEEL WORK, SEPTEMBER 26TH.

two floors above ground had been placed. This is somewhat unusual in steel building construction, but judging by the speed which has been made by both the general contractors and the steel contractor, it is probably fair to state that this method was successful.

The columns were designed for the full live load on the roof (on the fourteen storey basis) and on the three floors immediately below. The live load on the lower floor was reduced by 5 per cent. per floor of all the live load above in the usual manner until 50 per cent. of the live load is reached, continuing from this at 50 per cent.

Floor Construction

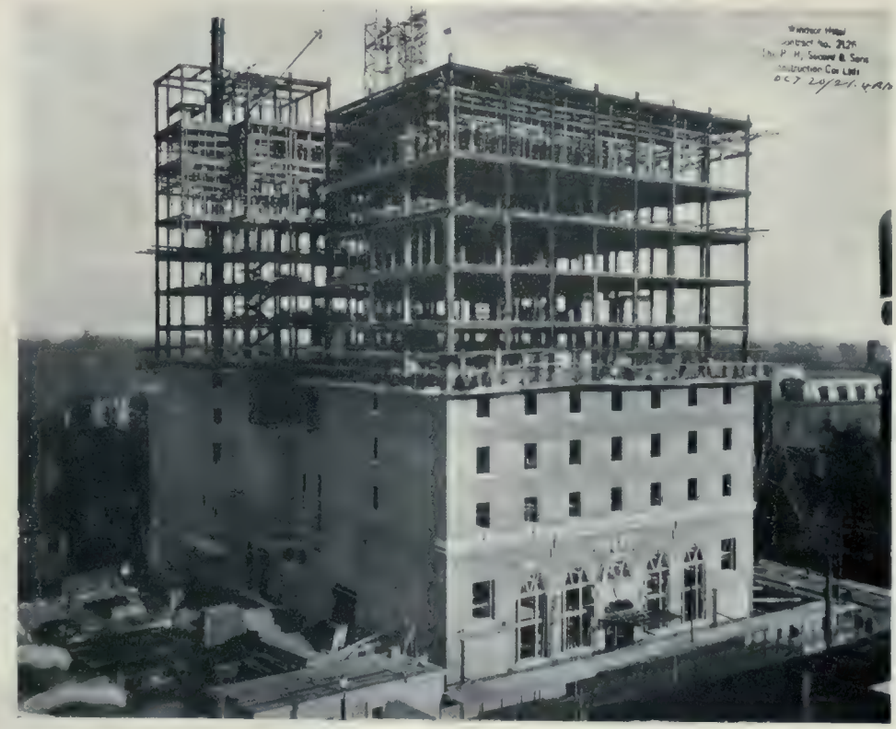
In choosing a system of floor construction, financial economy was of the first importance. It was, however, also desirable to arrange the general design in such a way that a flat ceiling effect could be obtained in the bedroom section. This was accomplished by placing the beams approximately twelve feet on centres, and to coincide as far as possible with the room partitions, and the span was bridged by a solid concrete slab, which gave the flat ceiling effect; the resultant economy being evidenced in the cost of the floor and also indirectly, in the saving in the total height of the building from that which would have been necessary by the use of a joist system of floors involving greater depth per floor.

Having selected a solid concrete floor slab, it was merely a question of deciding between stone concrete and cinder concrete, but in view of the difficulty of getting anthracite cinders, the stone concrete was adopted, and judging by the recent failure of a portion of the cinder concrete slab in the Marlborough-Blenheim Hotel, in Atlantic City, due to corrosion of the reinforcement, this decision appears to have been warranted.

There are eleven floor slabs, including the main roof which is designed as a floor, and the dormitory and pent house roofs also. The reinforcement used in the slabs consisted largely of one-half inch and three-eighth inch plain, square and round bars. The top of the structural steel beams are three inches below the top of the slabs to allow one half of the reinforcing steel to run over the beams in order to give continuous action in the slabs. All structural steel floor members are fire proofed with concrete poured with the slabs, while the columns are fire proofed with two inch terra cotta.

Foundations

The foundations of this building are of particular interest on account of the fact that they do not go to rock which occurs at the depth of some three hundred feet. The soil on which the building rests is a very hard variety of stiff, blue clay, and in making the excavation neither water nor quicksand were encountered.



FLOORS AND ROOF COMPLETED AND SPANDREL WALLS HALF UP (OCTOBER 30TH).

The tough nature of the clay is indicated in one of the foundation illustrations in which it will be observed in the embankment shown in the centre of the view that the marks from the teeth of the steam shovel still remain. Part of the excavation was taken out with pick and shovel.

The main column loads were transmitted to the soil through steel grillages resting on concrete footings. Where the loads did not warrant the use of steel grillages a steel base plate or "slab" was used. These slabs were placed directly on their respective concrete footings.

The upper tiers of the grillages were made up of pairs of fifteen inch channels riveted

back to back. It was found necessary to use channels in this way instead of I-beams on account of the column loads necessitating more web area for bearing than could be economically obtained by using I-beams. This obstacle has been overcome by some engineers by the use of angle stiffeners, but the amount of shop work necessary to obtain the proper bearing of the flanges of the beams on the angle stiffeners is less by using channels.

The lower tier of the grillage consist of I-beams in series, fastened together by a double row of bolts and gas pipe separators approximately three feet centre to centre. The top tier was bolted to the bottom tier in the shop as it was thought that a better bearing could thus be effected than by fastening the one tier to the other in the field.

The columns were erected with a base plate attached to the column in the shop which was placed directly on the grillage. This was done in order to permit the grillage beams to be grouted so that the top of the footing cap was flush with the top of the grillage. The grouting was carefully done by the general contractor under the supervision of the steel contractor in such a way that the top flange of the upper grillage beams would have reasonable bearing on the concrete, this being taken into consideration in the general design. The end of the steel column was planed before the base plate was attached but there is no planing between the grillage and the base plate.

The concrete footings were designed to carry the dead and live load, but were proportioned on the basis of the dead load only, in order to ensure even settlement of all portions of the building. This was specially important in view of the size of the building and on account of the foundations resting on clay and not on rock. The dead load of the building at the present time is practically all imposed on the foundations and no settlement has been reported.

There were three general types of foundations, namely:—

(1.) Square spread concrete footings.
(2.) Cantilevered concrete footings.
(3.) Combined cantilevered concrete footings.

The exterior basement walls were poured up to grade, and the grillages rested on the wall at this elevation, so that the load was distributed along the full length of the wall which distributes it to a continuous reinforced concrete wall footing eight feet three inches wide by three feet deep which was reinforced with three-quarter inch square bars, eight feet long and six feet on centre with five three-quarter inch square temperature bars running the full length of the wall.

The foundation design was complicated by the difference in elevation between the main basement floor and the boiler room floor which necessitated stepping the footings from one level to the other in order to prevent settlement.

One of the most important points in connection with the design of these foundations is that they are similar to the King Edward Hotel foundations (Toronto) in respect to the fact that the steel columns rest on the exterior wall at grade level. The advantages of this procedure has been very evident both in the King Edward Hotel foundations and also in the foundations of the Prince Edward Hotel, and are as follows:—

(1.) Saving in structural steel amounting to a number of the heaviest column sections in the building.

(2.) Saving in time of the total construction of the building. The foundations may be constructed and the exterior walls poured during the time the steel work is being fabricated.

The foundations and framework of the building, at the present time, are completed. The floors and roof are in place, and the spandrel walls are practically completed, and the progress of the work to date is considerably ahead of the pre-arranged schedule.

The site of the building has a frontage of 161 feet 4 inches on Park Street, and 89 feet 10½ inches on Ouelette Avenue, the two streets intersecting at an angle of 97 degrees and 18 minutes. The hotel is designed for fourteen storeys, ten being completed at the present time. The dormitory, which is located on the roof, and the pent house will be one hundred and sixty-two feet above grade, with a basement eighteen feet below grade.

The building will contain two hundred and forty-two bedrooms, each with a bath. On the lobby floor and mezzanine floors are located the dining-room, cafeteria, coffee-shop, ball room, etc. The building has a total floor area of 152,000 square feet, not including the basement.

The associated architects for the building are Messrs. Esenwein & Johnson, Messrs. Watt & Blackwell, and Mr. A. H. McPhail. The general contractors are Messrs. P. H. Secord & Sons Construction Company, Limited. The structural steel was fabricated and erected by the Canadian Bridge Company, Limited of Walkerville, Ontario.

How to Build a House

By A. Frank Wickson, Architect

(From the Presbyterian Witness)

OF making many houses, as of making many books there is no end, and of houses as of books it may be said that they are good, bad and indifferent. Unfortunately it must be added that the last class greatly preponderates, for it is the unpleasant truth that the majority of dwellings of our day are much below par in point of design.

The object of this brief article is to give a few outline suggestions as to the best methods to pursue to obtain homes of the medium size and smaller types that have all the qualities necessary to place them among the enviable minority.

As a starter the writer would utter earnest warning against the expectation of getting more than is paid for either in professional services or in the more tangible but not any more necessary, bricks and mortar. The chap who is in a hurry to get wealthy is surely liable to fall into a snare, but the desire to be rich does not get people into any more treacherous snares than the desire to get one hundred per cent worth of house for seventy-five per cent of dollars.

The first step in the process of obtaining a home is the proper selection of a property and this should, if possible, be one with some natural features which tend to make it attractive. A lot that is not on a dead level lends itself to a more interesting development of the plan than one that is perfectly regular and a site on the edge of a ravine is most desirable, only of course, there are insufficient ravine sites in most places to go round. A sloping lot often permits the erection of a low inviting looking house without the defects which sometimes accompany such a building.

Next—the owner and his best seven-eighths should, accompanied by their architect, make a careful inspection of the site, before preliminary sketches are begun and decide definitely on the best outlooks, note the surroundings generally and the adjoining buildings, or, if there be none, the kind that will probably be erected in the future.

Unstinted time should be given to the consideration of the preliminary studies. "The Preacher's" statement that "much study is a weariness of the flesh" is inapplicable to an architect's work for the lack of much study in his case often tends to a lot of weariness later on for his client. For those intending to build, say, in the spring, it is the part of wisdom to have preliminary studies made in early winter with ample time given for the development of the working drawings and specifications before the time for building actually arrives. Many prospective home builders only "get the bee" when the buds begin to burst and the birds begin to build forgetting that, as we don't work by instinct like the birds, there is such a thing as preparatory work to be done.

An owner having once decided on all the details of the plan of his house should if possible avoid changes and these are really quite unnecessary, if sufficient thought has been given to the preliminary work. Only an architect knows the destructiveness to a set of plans which apparently minor alterations will cause.

The plan or lay-out of a house is the important thing and in this planning the aspect of the main living rooms is the initial and essential part. These should be so located that they will get the most sunlight and give the best outlook regardless of whether their positions crowd the "front" door to one side or even around to the back.

If the site be in the city, and one more or less bare of trees or special features, the arrangement to be most carefully considered is that which will afford the maximum of sunlight in the rooms even to the exclusion of a main frontage towards the street, and above all things, avoidance should be made of dependence upon a neighbor's adjoining vacant lot for light, as there is no knowing how soon the vacancy may be occupied by buildings. If the site be in the suburbs or in the country the house should be located not only in regard to the sunlight but in its relation to the trees on the property. The result of a house being snuggled up against one or more fine large trees is in itself almost sufficient to create a real home.

If the plan be skillfully worked out the exterior is likely to be good also. A satisfactory plan may be accompanied by a poor elevation, but a bad plan is almost sure to be. A problem with which an architect is often confronted is to fit a residence onto a lot which has the most beautiful view to the north and in this case the rooms must not only be arranged to

obtain the advantage of this north aspect but the matter of the south views must not be overlooked. The house herewith illustrated was planned for a site having a north view over a beautiful ravine and with fine trees in close proximity and others a short distance away to the south-west. It will be observed that the living room and the main bedroom have windows facing south, east and north, the dining room has south windows but with one giving an outlook over the ravine. The breakfast room is set on an angle to catch the morning sunshine as directly as possible.

HOUSE AT PORT CREDIT, ONT.

In all planning great care should be given to the lines of traffic, curtailing as much as possible the distances between dining and breakfast rooms, servery and kitchen.

In the consideration of the essentials it is most advisable to give due regard to the construction of all parts of the building—those parts unseen but which like other hidden sins unexpectedly bring trouble and confusion to the sinner. "Hardwood floors throughout," does not necessarily mean a well built house—indeed it may be a case of throwing dust in the eyes. Hardwood floors may be laid any time, but if the construction be imperfect it's more than merely troublesome to get it remedied—it's generally impossible. It is of more real importance to have doors that are plumb, floors that are level, water that will flow freely, a roof that won't leak, flues that will draw, gas pipes that will give the metre a chance, heating ample and properly proportioned, proper insulation from the cold, and etc. (as Ring Lardner would say) than all sorts of attractive, but purely applied decorations. All of these things naturally cost money—but in the end pay well for the expenditure.

Plan sanely and avoid freakishness, remembering that some day a sale may be desirable and a freak plan seldom swells selling values. As an instance sometime ago a gentleman had his house built along certain lines rather out of the ordinary, it having been planned with a small parlor, a large dining room, an enormous servery with a kitchen sink and a kitchen without any sink. It suited him, but when he wanted to sell, as he ultimately did, it must have been entertaining to listen to the criticisms poured out on the poor architect. The purchaser, it may be said, proceeded at once to have plans drawn for such changes as would make the house ordinarily suitable.

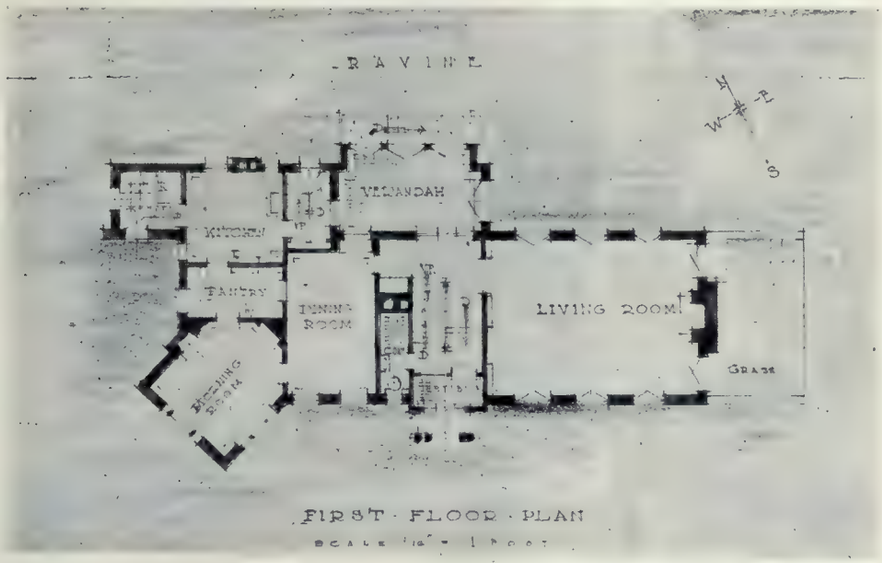
Regarding the exterior, generally speaking, houses should be simple in character and in good taste, in which case, they will never be "out of date." An English architect recently visiting Toronto, commended most highly as one of the city's beautiful homes a house built at least fifty years ago. A freak hat, even if rather attractive at first, soon becomes tiresome but—funds being available—it can be discarded and a new one purchased and a skirt with a little skill can be remodelled and shortened to conform to the shrinking style; but a building if ugly, eccentric, or a la mode, can only be remodelled at undue cost.

The one-storey real bungalow is most attractive as they who visit the South often proclaim, but for this climate is extravagant.

Two houses, one above the other or, in the vernacular, "duplex" houses, have certain advantages. If built on the space which would ordinarily be occupied by two separate houses each one can have twice the frontage of a single house and the property behind being twice the width of an ordinary lot can be laid out to much better advantage. Another obvious advantage is having a complete house on the one level.

A house designed with the main floor not more than two or three steps above the grade level is much more attractive in appearance to one raised several feet.

One great tendency which should be shunned is to make the house with a more elaborate design and more expensive material on the front than on the sides or the rear. A two-faced man is probably, like a lie, an abomination in the sight of the Lord; but a four faced house is a joy to the lover of all that is truthful. A house should be a source of pleasure to the owner as well as to passers-by and there's no reason why he should not enjoy the appearance from the garden quite as well as from the lawn. Toronto has suffered from an avalanche of houses of the smaller type in which a strained effort has been made to erect two storey houses with the appearance in the front of bungalows resulting in crudities which almost make one weep. Such things are in execrably bad taste, and a house of a storey and a half in height, should look like a storey and a half and if two storeys should look like a two storey house. Shams, whether human, house or pillows are never satisfactory.



HOUSE AT PORT CREDIT, ONT.

Town Planning in Ontario

By J. P. Hynes, President of the Ontario Town Planning and Housing Association

Excerpt of address delivered before the recent Toronto Town Planning and Housing Conference

THE experience of the various Town Planning and Housing Commissions established under the present legislation, will eventually determine the workability of the present statutes and point the direction for future legislation.

That town planning has not as yet come into its own in Ontario is admitted and the reasons why are so many and varied that it will take time and energy to overcome them.

One of the principal difficulties is that the man in the street always thinks the opportune time for such works has passed. In every city when a considerable town planning scheme is proposed, be its population numbered in the tens of thousands or the hundreds of thousands, the objection is always raised that it is too late, it should have been done years ago before values had risen to their present height.

However, it is when values are the highest, as in Paris, London and Chicago, that these improvements have been successfully carried through. Every town planning problem is a problem in constructive economics and its practicability is just as determinable as are those that are being constantly undertaken by transportation and other commercial companies, but unfortunately they are too often killed by the big politician, the big financier, by the man of big business, or by altogether as being impracticable without the first step being taken to scientifically determine the merits of the proposal.

This is why some permanent competent town planning body should be part of every municipal government. Such a body could accumulate the data on which to determine the feasible economic thing to do, be in a position to act when the opportunities present themselves, and not only to do the things that should be done when they should be done but prevent things being done that should not be done, and they are many in most cities.

In the light of this may it not be asked: (1) Who is taking care of the future physical development of cities in Ontario now? (2) Who has the data on which a proper decision in a town plan proposition may be made? (3) Is the physical development of the municipalities of Ontario being taken care of in accordance with the principles of scientific town planning of the day? (4) Is the data ready on which a town planning question may be properly decided when suddenly forced by railroad or property development? (5) Is it practicable to attempt to solve Town Planning without a comprehensive basic plan for the development of the territory? (6) Is it possible to produce a basic plan for development without an organization qualified to do it?

It is therefore necessary to consider whether or not under the present legislation, every municipality in Ontario has authority to provide itself with a competent body to take care of its future development, and if not what legislation should be passed that would make this provision.

That there should arise some question as to the inadequacy of the present legislation for municipal development is reasonable when it it recalled that the original municipal act of Ontario was passed in 1793 and that by constant amendments it is supposed to have been kept up to present date requirements. However possible this may be with the Law and Order and legislative provisions of the act, it appears to be impracticable in regard to physical development when it is recalled that in less than the last half of the period since that date, the urban population has increased 624 per cent while the rural has only increased 2.4 per cent. Cities now have hundreds of thousands of population where fifty years ago they had but tens of thousands. Electric and auto transportation have made the main thoroughfares of that day quite inadequate for the present requirements. High class districts of that day now harbour the foreign population in unhealthy congestion. The inadequate supply of houses has forced many Canadian-born and educated families to live two and even three families in a house built for one. For all this town planning is the doctor. Is it to have the legislative and financial facilities to affect the cure? That housing is inseparable from town planning is evident by the fact that the greater area of the city is required for houses, that the high cost of land forces houses to be built closely together requiring proper planning for the streets and property that each may have its proper share of sunlight so necessary for health and happiness.

That the Ontario Town Planning and Housing Association through its conferences may effectively act as the clearing house for the municipalities to arrive at an unanimity of opinion as to the legislation they are to ask for, it is necessary that the municipalities have their councillors become members of this As-

sociation and participate actively in its conferences. Town planning boards, welfare associations and women's clubs, should also register several of their members as members of the Association. Individuals deeply interested in town planning and housing such as social workers, professional town planning architects, engineers and surveyors are necessary to the success of our objects and I appeal to the present members to take it upon themselves to solicit new individual members as far as possible and to see to it that their municipal council is represented in our membership by several of its members.

Town planning is not limited to any profession or individual group, but is an important step in social and economic progress which calls for co-operative effort on the part of all public spirited bodies and citizens who by membership can give the association that active and financial support necessary to the furtherance of its objects.

Wages and Per Capita Wealth

Dealing with the subject of wage deflation and speaking particularly of conditions in the United States, an editorial in "Engineering and Contracting" (Oct. 5) states that it is part of the business of engineers, architects and business men to decide whether there will be enough further deflation to warrant postponement of a construction programme. There is a tendency, it adds, to answer this by guessing, for relatively few people realize that it can be reasoned out and that the correctness of the reasoning can be proved. The publication in question refers to a previous article in its columns on Past and Future Wage Levels which it holds will enable anyone to decide for himself as to what wage levels will be in the next few years, and then proceeds as follows.

"It was shown in that article that for the past 80 years average wages have changed in proportion to changes in the number of dollars of money per inhabitant ("per capita money"). Thus in 1840, the wage of common laborers averaged 75 ct. a day, whereas in 1913 it averaged $2.25 or three times as much.

"In 1840 carpenters received $1.25 a day, whereas in 1913 the average carpenter's wage was $3.75 or three times as much. In similar manner nearly all other wages were three-fold as great in 1913 as in 1840. Now, in 1840 the amount of "money in circulation" (in pocketbooks, tills, bank vaults, etc.), was $10.91 per inhabitant in America, whereas in 1913 it was $34.56, which is slightly more than three times the per capita money in 1840.

"During the 73 years intervening between 1840 and 1913, the per capita money and the average wage (or "wage level") increased together. During boom times the wage level rose faster than the money level, but after the collapse of every boom the wage level settled back to the money level, showing conclusively that the quantity of money per inhabitant is the fundamental factor that controls the average daily, weekly or monthly wage.

"The short lived boom that followed the close of the World War three years ago began to collapse a year and a half ago; and average wages began to fall. In the construction field the average wage is now about 60 per cent above what it was in 1913. Also the quantity of money in circulation is 60 per cent more per inhabitant than it was in 1913. Hence construction wages are now deflated to the new wage level, and nothing is to be saved in wages by postponing construction.

"Even if some saving were possible by waiting a year or more, it would not be good public policy, for the slight saving thus effected would be at the expense of a prolongation of the present industrial depression, which is tremendously costly to the entire nation.

"It is upon these grounds that we renew our appeal to the common sense of those in charge of public works to "Say it with public works jobs"—and say it soon."

To Move an Old Church Stone by Stone

Plans have been perfected to remove St. John's Episcopal Church, the oldest church in Cleveland, Ohio, from Church Avenue, N. W.; and West Twenty-Sixth Street, to a site on Clifton Boulevard. The plan is to take apart the church, which is built of stone, and remove it piecemeal to the new location, there to reassemble it as it stands on the present site. Contractors will be consulted for an opinion as to whether this plan is practical. The church can seat 600 persons and there would be no need of extensions at present, as the building is larger than is needed.

Apart from the nature of the undertaking an element of interest exists in that during the Civil War and before, the church was a station on the "underground railway," that mysterious channel by which fugitive slaves were smuggled from captivity in the south to freedom in Canada. Slaves were smuggled in loads of hay and in farm wagons from one community to another where abolitionists fed and clothed the fugitives.

The Economics of Town Planning

By Noulan Cauchon A.M.E.I.C., Chairman Town Planning Commission, Ottawa.

BIOLOGICALLY, an organism is a living entity, simple cell or complex, endowed with energy of growth and function. Human organism—the most complex known—is the *raison d'etre* of Town Planning—of its being a biological necessity.

The rays of the sun are the ultimate source of all energy on this planet, and as shown in the spectrum vibrate heat and light and chemical action. Sunshine and vivified air are indispensable nourishment for human development—without substitute—wherein lies their virtue beyond mere accessories of mechanical light and ventilation.

Cities which are the sheltering hives of human organisms must afford suitable environment for organic growth and development; failing which they cramp, maim, and kill that life which it is their proper function to engender, energize and enhance, and to bring to the realization of life.

Economics is the science of the conservation and the conversion of energy in the maintenance of life—of human life.

Government, in the abstract and in practice, should be synthetic organization for the maintenance of life—of community life—of civilization. This view of Government manifests a claim upon it for securing amongst other things, free access to sun rays and fresh air—energy—for us individually and collectively.

According to Hy. Fairfield Osborn, the "capture, storage and release" of energy is seemingly the problem of life itself. Our planning, if it would avail and survive, needs meet the requirements of life—of organic life—it must make provision for structure and its nourishment and for the development of function. Only that planning will prevail which recognizes the manifest oneness of Nature.

For the purpose of practical elucidation and accomplishment, forms and functions may more conveniently be detailed as unit characters.

Let us consider the great functional ramifications of communication in their relation to organic existence. The emergence of human speech and the advent of barter developed the written word and the highway—evolved the rapidity of modern thought transmission and of transportation—modern civilization. Railways are, therefore, but a subdivision of highway function, but so far differentiated as to require individual treatment.

Railways seem destined to maintain and to increase their utility for long and heavy haulage. This traffic will develop to the auxiliary measure of better highways and increased motor transport.

In the nature of things, railway facilities must adequately keep pace with the increase of population and production and their incidental services. Duplication is economic waste. A measure of competition is valuable as stimulus in social service, but if extended to the over stimulation of duplication will, by natural law, defeat its own purpose and is uneconomic and a waste of energy.

The principle to be applied as regards cities is *Union Terminals*. There is little question as to the wisdom of a single system of trackage minimizing movements, crossings, and vast unnecessary capital expenditure. But there are optional ways of operating the necessary plant—ways of efficiency. The more complex an organism the more delicate its functioning.

Montreal, as our largest city in Canada, is suffering from the lack of proportion in its services.

The purpose of town planning is to avoid and to eliminate congestion—on the railways, on the highways, and in all the vital agencies of progressive existence.

Montreal's problem is emphasized by its railway and its highway requirements—it is conditioned by the necessary disposition of its centres of activity along the harbor front, and in turn is subject to the topographical limitations of the adjacent mountain. The City of Hamilton has a somewhat similar problem.

A housing problem also exists in Montreal the same as in smaller centres, only more so by reason of acceleration in size; it is all part of the oneness of a problem of existence which awaits progressive solution.

To quote from a previous address to a Committee of the Senate (May 25, 1921);—"It follows that determining the occupancy of land and of buildings, the width of streets and the height and bulk of structures in relation thereto, the access of light and of air, zoning, housing, the capacity of transportation, is elemental to healthy freedom of growth and of circulation; all to the measure of their deficiency, shadow the birth rate and the death rate."

The economics of regional planning, urban and rural, is therefore the science of energy, of the conversion and conservation of energy, in the maintenance of life. It seeks to implement the social significance of scientific revelation.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER; LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO, - - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street
E. J. Shearman, Representative.

WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned. **Entered as Second Class Matter in the Post Office at Toronto, Canada.**

Vol. XIII. Toronto, November, 1921 No. 11

Construction Industries to Meet in Hamilton

The fourth annual conference of the Association of the Canadian Building and Construction Industries is to be held shortly after the first of the year in the City of Hamilton, Ont., the proposed dates being January 17 to 20. The sessions will be held in the ball room of the Royal Connaught Hotel.

While the details of the program which are at present being arranged by the executive, are still lacking, it is announced that it is the intention at the forthcoming meeting not only to have discussions on various vital problems which have arisen in the construction industry during the past year but to present a number of features of an educational nature that will be of utmost interest to members of the different sections.

In addition to this, the executive is planning an interesting departure at this conference in apportioning space along the sides and back of the conference hall, which which will be available to manufacturing and supply members for exhibit purposes. This feature of the convention will be in charge of Mr. E. B. Osborne, secretary of the Hamilton Association to whom entry should be made at the earliest possible date by those desiring to reserve space. The daily luncheons, which have been such an enjoyable feature of the previous conferences will give an opportunity for some of the leading citizens of Hamilton and men in public life to address the delegates. Other social features are also being arranged, and not only is a large attendance anticipated, but in view of present conditions in the industry and the possibility of an early revival of construction in Canada, great interest is looked for in the sessions. In all a most successful gathering is expected and the program which is at present being worked out by the executive will be announced as soon as details are completed.

O.A.A. Executive Plan Busy Year

The newly elected executive of the Ontario Association of Architects is preparing for a busy year and have arranged a schedule of Council meetings to be held on the following dates in different parts of the province :—

Ottawa, November 26	Windsor, April 29
Toronto, December 31 (1922)	Toronto, May 27
	Ottawa, June 24
London, January 28	Toronto, July 29
Toronto, February 25	Toronto, August 26
Hamilton, March 25	Hamilton, Sept. 25-26

These meetings are to be full Council meetings and will be divided into three sessions i.e., the morning to be devoted to routine business, the afternoon to discussion for furthering the activities of the association, and the evening to an open Chapter meeting to be taken up with an architectural or other art subject.

The executive is desirous that the membership of the association should be kept in full touch with these meetings and is urging that any topic which any member may wish to have discussed should be brought to its attention. In this way it is felt that the membership and the Council will be in more complete contact and that an unanimity of opinion on matters that affect the association will be established, thus enabiling the association to actually express the opinion of its members.

New Industry for London

The London Concrete Machinery Company of London, Ont., have purchased the business of the Ideal Concrete Machinery Company of Windsor and are moving the entire plant to London. The Ideal line consists of the Ideal concrete block machine, Ideal power tamper and ornamental moulds.

The Ideal concrete block machine was the first concrete block machine placed on the market making the face of the block in the bottom of the mould, allowing the blocks to be faced with richer material; also the first to use a horizontally withdrawn core. This company controls the basic patents covering these features and also many other patents in block making machinery.

The London Concrete Machinery Company who already have a very large business in the well known "London Line" covering concrete mixers, hoists,pumps and other contractors' equipment, are making provision for greatly increasing the output of Ideal Concrete Block Machines. Their new catalogue covering this line will be issued about December 1st and will be mailed on request.

Personal

William Murdoch who has been with the Northern Electric Company for the past 25 years, and has been branch manager at Halifax, since 1912 in charge of the company's business in the Maritime provinces, has severed his connection with the above firm. Mr. Murdoch is well known to the trade, having been prior to joining the above concern in the employ of the Royal Electric Company, Limited, and has had a broad experience in the electrical business. He was instrumental to a large extent in bringing about the successful organization of the Electric Association of Nova Scotia and at the annual meeting was unanimously elected as the association's president. While his plans have not been definitely determined it is understood that Mr. Murdoch after a brief holiday anticipates engaging in the electrical business at Halifax.

Telescopic Hoists

Gillis & Geoghegan, 535 West Broadway, New York, have just issued a new 20 page 8 1/2 x 11 inch two-color catalog. It is fully illustrated with photographs of actual installations of G & G Telescopic Hoists, as used for handling ash cans, barrels, trays, and other loads. It also contains two forms of specification for each model, one a very short form and another which describes the various parts of a complete telescopic hoist installation. Any one interested may obtain a copy by writing the above firm.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in This Issue.

CANADA BREAD COMPANY'S BUILDING.

General Contractor, Fred Holmes Sons, Ltd.
Structural Steel, McGregor & McIntyre.
Concrete Work, Crescent Concrete Co.
Reinforcing Stel, Peckover Limited.
Reinforcing Steel, Peckover Limited.
Interior Partition, Ebsary Tile Co.
Enamel Brick, Don Valley Brick Works.
Mixers, Wm. & J. G. Greey.
Mixers, Jos. Baker Perkins Co.
Oven, Jos. Baker Perkins Co.
Conveyors, Canadian Matthews Gravity Carrier Company
Scale, Toledo Scale Company.
Tile Work, Italian Mosiac & Tile Co.
Automobile Scale, Canadian Fairbanks-Morse Co.
Plumbing, Purdy-Mansell Co.
Heating, Purdy-Mansell Co.
Roofing, Douglas Bros.
Elevators, Turnbull Elevator Co.
Electric Work, Harris & Marson.
Humidifying Apparatus, Canadian Sirocco Co.

J. P. Anglin, B.Sc., President. H. J. Gross, Vice-Pres. & Treas. C. D. Harrington, B.Sc., Vice-Pres. & Manager.

ANGLIN-NORCROSS LIMITED

CONTRACTING ENGINEERS AND BUILDERS.

MONTREAL TORONTO HALIFAX

SINCE 1852!

WAY back in '52, when Montreal was in its infancy, the firm of Geo. W. Reed & Company, Limited, was founded. And for the past seventy years we've been specializing in roofs. To-day "REED-CLAD" ROOFS are the recognized standard of Engineers and Architects.

Reed Roofs are Quality Roofs—you can depend on them. Nothing but the best of materials and the most skilled workmanship are employed.

Specify "REED-CLAD" Roofs for all your buildings and your clients will get THE BEST.

KEEP CANADA BUSY

GEO. W. REED & CO.

LIMITED

MONTREAL

Directory for Architects, Engineers, Contractors

OF DEPENDABLE

Building Material, Supplies and Equipment

Air Compressors.
Canadian Allis Chalmers, Ltd.

Air Receivers.
Canadian Allis Chalmers, Ltd
Canadian Blower & Forge Co., Ltd.

Air Washers and Humidifiers.
Canadian Blower & Forge Co.
Canadian Sirocco Co.
Sheldons Limited.

Anchor Bolts.
Steel Co. of Canada.

Angle Bars.
Steel Co .of Canada.

Architectural Bronze and Iron Work.
Canada Wire & Iron Goods Co.
Canadian Allis Chalmers, Ltd.
Canadian Wm. A. Rogers, Ltd.
Dennis Wire & Iron Works Co.
Dominion Architectural Iron Works.

Architectural Terra Cotta.
Toronto Plate Glass Imp. Co.

Asbestos Products.
Canadian Johns-Manville Co., Ltd.

Asbestos Building Lumber.
Canadian Johns-Manville Co., Ltd.

Ash Hoists.
Gillis & Geoghegan.

Bank and Office Railings.
Canada Wire & Iron Goods Co.
Canadian Allis Chalmers, Ltd.
Dennis Wire & Iron Works Co.

Bank and Office Window Blinds.
Canada Wire & Iron Goods Co.

Bank Furniture.
Canadian Office & School Furniture Co., Ltd.

Bath Room Fittings.
Canada Metal Co., Ltd.

Bathroom Furniture, Steel.
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.

Bent Glass.
Consolidated Plate Glass Co.
Toronto Plate Glass Imp. Co.

Belting (Rubber).
Dunlop Tire & Rubber Goods Co., Ltd.

Blackboards.
Geo. W. Reed & Co., Ltd.

Blowers.
American Blower Co.
Sheldons Limited.
Canadian Blower & Forge Co.

Boilers.
Canadian Allis Chalmers, Ltd.
Goldie & McCulloch Co., Ltd.

Bolts & Nuts, all kinds.
Steel Co. of Canada.

Book Stacks (Metal).
Dennis Wire & Iron Works Co.

Brass Goods.
Dennis Wire & Iron Works Co.
Mueller, H., Mfg. Co., Ltd.

Brick.
Don Valley Brick Works.

Brick Machines.
London Concrete Machinery Co.
Wettlaufer Bros., Ltd.

Bridges.
Canadian Allis Chalmers, Ltd.
Dominion Bridge Co.
Hamilton Bridge Works Co.

Bronze Doors.
Canadian Allis Chalmers, Ltd.
Canadian Wm. A. Rogers, Ltd.
Dennis Wire & Iron Works Co.
Ornamental Iron Products Co.

Building Paper and Felts.
Asbestos Mfg. Co.
Barrett Mfg. Co.
Bishopric Wall Board Co.
Canadian Asbestos Co.
Canadian Johns-Manville Co., Ltd.
Geo. W. Reed & Co., Ltd.

Buildings (Steel).
Canadian Allis Chalmers, Ltd.
Hamilton Bridge Works Co.
Trussed Concrete Steel Co.

Carriers.
Canadian Mathews Gravity Carrier Co., Ltd.

Cars (Factory and Dump).
Sheldons Limited.

Cabinets, Steel.
Dennis Wire & Iron Works Co.
Canada Wire & Iron Goods Co.

Casement Windows.
Canadian Metal Window & Steel Products Co., Ltd.
Trussed Concrete Steel Co.

Ceilings (Metal).
Pedlar People, Ltd.
Galt Art Metal Co.

Cement.
Alfred Rogers, Ltd.
Canadian Johns-Manville Co., Ltd.
Super Cement Limited.

Church Furniture.
Globe Furniture Co., Ltd.
Valley City Seating Co., Ltd.

Closet Tanks.
Canada Metal Co., Ltd.

Cold Storage Equipment.
Canadian Ice Machine Co.

Concrete Block Machines.
London Concrete Machinery Co.

Concrete Construction (Reinforced).
Corrugated Bar Co.
Pedlar People, Ltd.
Trussed Concrete Steel Co.

Concrete Hardener.
Trussed Concrete Steel Co.
Canada Paint Co., Ltd.

Concrete Paints.
Canada Paint Co., Ltd.

Concrete Steel.
Canada Wire & Iron Goods Co.
Corrugated Bar Co.
Hamilton Bridge Works Co.
Pedlar People, Ltd.
Trussed Concrete Steel Co.
Steel Company of Canada, Ltd.

Conduits (Electric).
Canadian Johns-Manville Co., Ltd.
Canadian General Electric Co.
Conduits Co., Ltd.
National Conduit Co., Ltd.
Northern Electric Co., Ltd.

Corner Beads.
Pedlar People, Ltd.

Couplings.
Steel Co. of Canada.

Cranes.
Dominion Bridge Co., Ltd.
Hamilton Bridge Works Co.

Damp Proofing.
Barrett Co., Limited.
Geo. W. Reed & Co., Ltd.
Trussed Concrete Steel Co.

Desks.
Canadian Office & School Furniture Co., Ltd.

Deposit Boxes.
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Goldie & McCulloch Co., Ltd.
Taylor, J. & J.

Desks, Steel.
Dennis Wire & Iron Works Co.
Steel Equipment Co.

Door Hangers.
Richard Wilcox Canadian Co
Slater, N., Co., Ltd.

Drawing Pencils.
American Lead Pencil Co.

Drinking Fountains.
Mueller, H., Mfg. Co., Ltd.

Drying Appliances.
Canadian Blower & Forge Co.
Sheldons Limited.

Dry Colors.
Carter White Lead Co
Canada Paint Co., Ltd.

Dumb Waiters.
Turnbull Elevator Co.

Electrical Equipment.
Canadian General Electric Co.
Canadian Johns-Manville Co., Ltd.
Northern Electric Co.
Benjamin Electric Co.

Electric Fixtures.
Canadian General Electric Co

Electric Glassware.
Jefferson Glass Co., Ltd.

Electric Hoists.
Turnbull Elevator Co.
Gillis & Geoghegan.

Elevators Doors and Enclosures.
Canada Wire & Iron Goods Co.
Canadian Allis Chalmers, Ltd
Canadian Metal Window & Steel Products Co., Ltd.
Dennis Wire & Iron Works Co.
Ornamental Iron Products Co.
Turnbull Elevator Co.

Elevators (Passenger and Freight).
Turnbull Elevator Co.

Elevator Door Fixtures.
Richard Wilcox Canadian Co.

Engines.
Canadian Blower & Forge Co.
Goldie & McCulloch Co., Ltd
Sheldons Limited.

Engineers' Supplies.
Canadian Blower & Forge Co.
Sheldons Limited.

Exhaust Fans.
Canadian Sirocco Co.
Canadian Blower & Forge Co.
Sheldons Limited.

Expanded Metal.
Galt Art Metal Co.
Pedlar People, Ltd.
Trussed Concrete Steel Co.

Expansion Bolts.
Northern Electric Co., Ltd.

Felts, Sound Deadening and Insulating.
Canadian Johns-Manville Co., Ltd.

Fencing (Iron and Wire).
Canadian Allis Chalmers, Ltd.
Dennis Wire & Iron Works Co.
Ornamental Iron Products Co.
Steel Co. of Canada.

Fire Doors.
Canadian Metal Window & Steel Products, Ltd.
Galt Art Metal Co.
Pedlar People, Ltd.
Geo. W. Reed & Co., Ltd.
Richard Wilcox Canadian Co.

Fire Door Fittings.
Slater & Barnard, Limited.
Canadian Metal Window & Steel Products, Ltd.
Geo. W. Reed & Co., Ltd.
Canada Wire & Iron Goods Co.
Richard Wilcox Canadian Co.
Canadian Johns-Manville Co., Ltd.

Fire Escapes.
Canadian Allis Chalmers, Ltd.
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Reid & Brown.

Fireproofing.
Asbestos Mfg. Co.
Canadian Johns-Manville Co., Ltd.
National Fireproofing Co.
Pedlar People, Ltd.
Trussed Concrete Steel Co.

Fireproof Steel Doors.
Canadian Metal Window & Steel Products, Ltd.
Canada Wire & Iron Goods Co.
Douglas Bros., Ltd.
Pedlar People, Ltd.
Geo. W. Reed & Co., Ltd.

Fireproof Windows.
Pedlar People, Ltd.
Trussed Concrete Steel Co.
Canadian Metal Window & Steel Products, Ltd.
Geo. W. Reed & Co., Ltd.

Flooring, Asphalt.
Geo. W. Reed & Co., Ltd.

Floor Hardener.
Trussed Concrete Steel Co.

Flooring.
Canadian Johns-Manville Co., Ltd.

Flooring-Sub.
Bishopric Mfg. Co.

Garage Hardware.
Richard Wilcox Canadian Co

Galvanized Iron.
Pedlar People, Ltd.
Galt Art Metal Co.
Geo. W. Reed & Co., Ltd.

Gates (Iron and Bronze).
Canadian Allis Chalmers, Ltd.
Dennis Wire & Iron Works Co.
Dominion Architectural Iron Works.
Steel Co. of Canada.

Glass.
Consolidated Plate Glass Co.
Toronto Plate Glass Imp. Co.

Graphite Paint.
Dominion Paint Works.
Canada Paint Co., Ltd.

Greenhouse.
Lord & Burnham Co.

Grille Work.
Canada Wire & Iron Goods Co
Canadian Allis Chalmers, Ltd.
Dennis Wire & Iron Works Co.
Dominion Architectural Iron Works.
Ornamental Iron Products Co.
Taylor, J. & J., Ltd.
Turnbull Elevator Co.

Gypsum Tile.
Ontario Gypsum Co., Ltd.

Hangers.
Slater, N., Co., Ltd.
Richard Wilcox Canadian Co.

Hardware.
Richard Wilcox Canadian Co.

Headlights.
Crouse Hinds Co. of Canada.

Heating Apparatus.
Canadian Blower & Forge Co.
Canadian Sirocco Co.
Dunham, C. A., Co., Ltd.
Goldie & McCulloch Co., Ltd.
Sheldons Limited.

Heaters—Feed Water.
Canadian Allis Chalmers, Ltd.

Heating Engineers and Contractors.
Geo. W. Reed & Co., Ltd.
Canadian Blower & Forge Co.
Canadian Sirocco Co.
Sheldons Limited.

Heating Systems.
Dunham, C. A., Co., Ltd.

Hollow Tile.
Don Valley Brick Works.
National Fireproofing Co.

Hoists (Steam, Gas or Electric).
Gillis & Geoghegan.

Hoisting Machinery.
Turnbull Elevators.

Hose.
Dunlop Tire & Rubber Goods Co., Ltd.

Hospital Furniture, Steel.
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.

Hospital Trucks.
Canada Wire & Iron Goods Co
Dennis Wire & Iron Works Co.

Hot Water Boilers.
Dominion Radiator Co., Ltd.

Ice Machinery.
Canadian Ice Machine Co.

Ice Making Plants.
Canadian Johns-Manville Co., Ltd.

Inspecting Engineers.
Canadian Inspection and Testing Laboratories, Limited.

Insulation.
Asbestos Mfg. Co.
Canadian Asbestos Co.
Canadian Johns-Manville Co., Ltd.

Insulating Base.
Bishopric Mfg. Co.
Canadian Johns-Manville Co., Ltd.

Interior Woodwork.
Canadian Office & School Furniture Co., Ltd.
Georgian Bay Shooks Mills.

Iron Bars.
Steel Co. of Canada.

STEEL BARS

FOR

CONCRETE REINFORCEMENT

Cold Twisted
Squares
or
Plain Rounds

HAMILTON

THE STEEL COMPANY OF CANADA LIMITED

Rolled from
New
Open Hearth
Steel Billets

MONTREAL

ARCHITECTURAL DIRECTORY—Continued

Iron Doors and Shutters.
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Taylor, J. & J., Ltd.
Geo. W. Reed & Co., Ltd.

Iron Stairs.
Canada Wire & Iron Goods Co.
Geo. W. Reed & Co., Ltd.
Canadian Allis Chalmers, Ltd.
Dennis Wire & Iron Works Co.
Ornamental Iron Products Co.

Iron Preservative.
Canadian Johns-Manville Co., Ltd.

Jail Cells and Gates.
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Goldie & McCulloch Co., Ltd.
Taylor, J. & J., Ltd.

Joist Hangers.
Hamilton Bridge Works Co.
Richard Wilcox Canadian Co.
Trussed Concrete Steel Co.

Lamps, Electric.
Canadian General Electric Co.
Northern Electric Co., Ltd.
Jefferson Glass Co., Ltd.

Lamp Standards.
Canadian Allis Chalmers, Ltd.

Laundry Tubs.
Canada Metal Co., Ltd.

Lath (Metal).
Galt Art Metal Co.
Pedlar People, Ltd.
Trussed Concrete Steel Co.

Lighting Fixtures.
Benjamin Electric Mfg. Co.
Canadian General Electric Co.
McDonald & Wilson, Ltd.

Lockers (Steel Material).
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Dominion Architectural Iron Works.

Memorial Tablets.
Canadian Wm. A. Rogers Co.

Metal Shingles.
Geo. W. Reed & Co., Ltd.
Galt Art Metal Co.
Pedlar People, Ltd.

Metal Store Fronts.
Consolidated Plate Glass Co.
Pedlar People, Ltd.

Metal Walls and Ceilings.
Galt Art Metal Co.
Pedlar People, Ltd.
Geo. W. Reed & Co., Ltd.

Mineral Wool.
Canadian Johns-Manville Co., Ltd.

Nails, Wire & Cut.
Steel Co. of Canada.

Nipples.
Steel Co. of Canada.

Ornamental Iron Work.
Canada Wire & Iron Goods Co.
Canadian Allis Chalmers, Ltd.
Dennis Wire & Iron Works Co.
Ornamental Iron Products Co.
Turnbull Elevator Co.

Overhead Carrier Systems.
Ornamental Iron Products Co.
Richard Wilcox Canadian Co.

Packing.
Canadian Johns-Manville Co., Ltd.
Jenkins Bros., Limited.

Packing (Rubber).
Dunlop Tire & Rubber Goods Co., Ltd.

Paints and Stains.
Barrett Co., Ltd.
Canada Paint Co., Ltd.

Panel Boards.
Canadian Johns-Manville Co., Ltd.
Crouse Hinds Co. of Canada.

Paints (Preservative).
Barrett Co., Ltd.
Canada Paint Co., Ltd.
Canadian Johns-Manville Co., Ltd.
Dominion Paint Works.

Paints (Steel and Iron).
Barrett Co., Ltd.
Canada Paint Co., Ltd.
Canadian Johns-Manville Co., Ltd.
Dominion Paint Works.

Paper, Fire and Damp-proof, Building.
Canadian Johns-Manville Co., Ltd.

Partitions.
Asbestos Mfg. Co.

Partitions (Lavatory).
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Pickering, I. G., & Co.

Plaster Base.
Bishopric Mfg. Co.

Pencils.
American Lead Pencil Co.

Pig Iron.
Steel Co. of Canada.

Pipe.
Steel Co. of Canada.

Pipe Covering.
Asbestos Mfg. Co.
Canadian Johns-Manville Co., Ltd.
Canadian Asbestos Co.

Plaster Board.
Ontario Gypsum Co., Ltd.

Plate and Window Glass.
Consolidated Plate Glass Co.
Toronto Plate Glass Co.

Plumbing Fixtures.
Canada Metal Co., Ltd.
Empire Mfg. Co., Ltd.
Mueller, H., Mfg. Co., Ltd.
Robertson, Jas., Co., Ltd.

Porcelain Specialties.
Crouse Hinds Co. of Canada.

Pumps (Centrifugal and Diapragm).
Canadian Allis Chalmers, Ltd.
Canadian Blower & Forge Co.

Pumps—Steam and Power.
Canadian Allis Chalmers, Ltd.
Canadian Blower & Forge Co.

Putty.
Canada Paint Co.
Steel Co. of Canada.

Radiators.
Dominion Radiator Co., Ltd.
Taylor Forbes Co., Ltd.

Radiator Traps.
Canadian Johns-Manville Co., Ltd.
Dunham, C. A., Co.

Radiator Valves.
Canadian Johns-Manville Co., Ltd.
Dunham, C. A., Co.

Receptacles.
Harvey Hubbell Co. of Canada

Reducing Valves.
Dunham, C. A., Co.
Jenkins Bros.

Reflectors.
Benjamin Electric Mfg. Co.

Refrigerators and Equipment.
Canadian Johns-Manville Co., Ltd.

Registers (Heating and Ventilating.
Canada Wire & Iron Goods Co
Dennis Wire & Iron Works Co.

Reinforcing (Concrete).
Pedlar People, Ltd.
Reid & Brown.
Trussed Concrete Steel Co.

Return Traps.
Jenkins Bros., Ltd.

Rivets & Burrs.
Steel Co. of Canada.

Rock Crushers.
Canadian Allis Chalmers, Ltd.

Roof Cement.
Barrett Co., Ltd.
Geo. W. Reed & Co., Ltd.
Canadian Johns-Manville Co., Ltd.

Roofing.
Asbestos Mfg. Co.
Barrett Co., Ltd.
Canadian Johns-Manville Co., Ltd.
Geo. W. Reed & Co., Ltd.

Roof Coating.
Canadian Johns-Manville Co., Ltd.

Roof Sheathing.
Bishopric Mfg. Co.

Roofing Tile.
Ludowici-Celadon Co.

Rubber Tiling.
Dunlop Tire & Rubber Goods Co., Ltd.
Gutta Percha & Rubber Co.

Safes (Fireproof and Bankers').
Goldie & McCulloch Co., Ltd.
Taylor, J. & J., Ltd.
York Safe & Vault Co.

School Furniture.
Canadian Office & School Furniture Co.
Globe Furniture Co., Ltd.

Screws (Wood and Machine)
Steel Co. of Canada.

Seating.
Globe Furniture Co., Ltd.

Shadeholders.
Harvey Hubbell Co. of Canada

Shafting, Pulleys and Hangers.
Goldie & McCulloch Co., Ltd.
Waterous Engine Works Co.

Sheathing.
Barrett Co., Ltd.
Bishopric Mfg. Co.
Canadian Johns-Manville Co., Ltd.
Geo. W. Reed & Co., Ltd.

Sheet Metal Work.
Douglas Bros., Ltd.
Canadian Blower & Forge Co.
Galt Art Metal Co.
Pedlar People, Ltd.
Geo. W. Reed & Co., Ltd.
Sheldons Limited.

Shelving (Steel).
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Geo. W. Reed & Co., Ltd.

Shingles.
Asbestos Mfg. Co.
Barnett Co., Limited.
Canadian Johns-Manville Co., Ltd.
Geo. W. Reed & Co., Ltd.
Shingle Agency of British Columbia.

Sidewalk Doors and Grates.
Canada Wire & Iron Goods Co.
Dennis Wire & Iron Works Co.
Dominion Architectural Iron Works.
Ornamental Iron Products Co.

Siding, Fireproofing.
Canadian Johns-Manville Co., Ltd.

Signal Systems.
Northern Electric Co., Ltd.

Signs (Brass, Bronze, Wire Factory, etc.).
Dennis Wire & Iron Works Co.

Skylights.
Douglas Brothers.
Pedlar People, Ltd.
Reed, Geo. W., Co.
Galt Art Metal Co.
Canadian Johns-Manville Co., Ltd.

Sound-Deadening.
Bishopric Mfg. Co.
Canadian H. W. Johns-Manville Co., Ltd.

Spikes (Railway and Pressed)
Steel Co. of Canada.

Steam Specialties.
Canadian Allis Chalmers, Ltd.
Canadian Johns-Manville Co., Ltd.
Dunham, C. A., Co.
Jenkins Bros.
Mueller, H., Mfg. Co., Ltd.
Sheldons Limited.

Steel Bars for Concrete Reinforcement.
Corrugated Bar Co.
Hamilton Bridge Works Co.
Reid & Brown.
Steel Co. of Canada, Ltd.
Trussed Concrete Steel Co.

Steel and Iron Bars.
Steel Co. of Canada.

Steel Cabinets.
Dennis Wire & Iron Works Co.
J. & J. Taylor, Ltd.

Steel Concrete Construction.
Pedlar People, Ltd.
Trussed Concrete Steel Co.

Steel Furniture.
Canada Wire & Iron Goods Co
Dennis Wire & Iron Works Co.

Steel Doors.
Canadian Allis Chalmers, Ltd.
Canada Wire & Iron Goods Co.
Galt Art Metal Co.
Pedlar People, Ltd.
Geo. W. Reed & Co., Ltd.

Steel Sash.
Canadian Metal Window & Steel Products, Ltd.
Galt Art Metal Co.
Pedlar People, Ltd.
Reed, George W. & Co.
Trussed Concrete Steel Co., Ltd

Steel Sheets, OPCR & BA & Blue Annealed.
Steel Co. of Canada.

Stone.
Canada Crushed Stone Corporation, Ltd.
Queenston Quarry Co., Ltd.
Stanstead Granite Quarries.

Store Fronts Construction.
Consolidated Plate Glass Co., Ltd.
Dennis Wire & Iron Works Co.
Zouri Drawn Metals Co.

Structural Steel.
Canadian Allis Chalmers, Ltd.
Dominion Bridge Co.
Hamilton Bridge Works Co.
Reid & Brown.
Sheldons Limited.
Steel Co. of Canada.

Stucco, Asbestos.
Canadian Johns-Manville Co., Ltd.

Stucco Base.
Bishopric Mfg. Co.

Stucco Board.
Bishopric Wall Board Co.

Structural Iron Contractors.
Dominion Bridge Co.
Hamilton Bridge Works Co.
Reid & Brown.

Switches (Knife and Radial).
Crouse Hinds Co. of Canada.

Skitches Safety.
Canadian Johns-Manville Co., Ltd.

Switchboards.
Crouse Hinds Co. of Canada.

Tanks.
Canadian Allis Chalmers, Ltd.
Canadian Blower & Forge Co.
Geo. W. Reed & Co., Ltd.

Tanks (Reinforce' Concrete).
J. B. Nicholson, Ltd.

Tablets (Brass and Bronze).
Canadian Allis Chalmers, Ltd.
Dennis Wire & Iron Works Co.

Telephone Systems.
Canadian Independent Telephone Co., Ltd.
Northern Electric Co.

Theatre Seating.
Globe Furniture Co., Ltd.

Tie Plates.
Steel Co. of Canada.

Tile (Gypsum).
Ontario Gypsum Co., Ltd.

Tile, Hollow.
Don Valley Brick Works.
National Fireproofing Co., Ltd.

Tile & Sewer Pipe Machinery.
London Concrete Machinery Co.

Tile, Roofing.
Ludowici-Celadon Co.

Tiling (Rubber).
Dunlop Tire & Rubber Goods Co., Ltd.

Tile, Wall and Floor.
Frontenac Floor & Wall Tile Co.
Italian Mosaic & Marble Co.

Time Clocks.
International Business Machines Co., Limited.

Toilet Partitions.
The Vitrolite Co.
Pickering, I. G., & Co .

Trapping Machines.
Mueller, H., Mfg. Co., Ltd.

Trucks.
Brantford Oven & Rack Co.
Dennis Wire & Iron Works Co.

Vacuum Cleaners.
United Electric Co., Ltd.

Valves.
Dunham, C. A., Co.
Dunlop Tire & Rubber Goods Co., Ltd.
Kerr Engine Co.
Jenkins Bros., Limited.
Mueller, H., Mfg. Co., Ltd.

Varnishes.
Canada Paint Co., Ltd.
Dougall Varnish Co., Ltd.
Jamieson, R. C., Co.

Vaults and Vault Doors (Fireproof and Bankers').
Goldie & McCulloch Co., Ltd.
Taylor, J. & J., Ltd.
York Safe and Vault Co.

Ventilators.
Canadian Blower & Forge Co.
Canadian Sirocco Co.
Galt Art Metal Co.
Pedlar People, The.
Geo. W. Reed & Co., Ltd.
Sheldons Limited.

Wallboard.
Asbestos Mfg. Co.
Bishopric Wall Board Co.
Canadian Johns-Manville Co., Ltd.

Wardrobes (Steel).
Canada Wire & Iron Goods Co.
Dennis Wire and Iron Works.

Washers.
Steel Co. of Canada.

Waterproofing.
Barrett Co., Limited.
Canada Paint Co., Ltd.
Canadian Johns-Manville Co., Ltd.
Geo. W. Reed & Co., Ltd.
Trussed Concrete Steel Co.

Waterworks Supplies.
Canada Wire & Iron Goods Co.
Mueller, H., Mfg. Co., Ltd.

White Lead.
Canada Paint Co., Ltd.
Steel Co. of Canada.

Window Screens.
International Nickel Co.

Window Guards.
Canada Wire & Iron Goods Co.
Ornamental Iron Products Co.

Wire, all kinds.
Steel Co. of Canada.

Wire Cloth.
Canada Wire and Iron Goods Co.

Wire Fence.
Steel Co. of Canada.

Wire Rope.
Canada Wire and Iron Goods Co.

Wire Work.
Canada Wire and Iron Works.
Dennis Wire and Iron Works.

Showing the Boiler Room of The Imperial Oil Co. at Dartmouth, N.S. equipped with 8-G. & McC. Sectional Water-Tube Boilers

G. & McC. Co
Sectional Water-Tube
BOILERS

Are Superior in Design and Workmanship

Greater Cumbustion Area
Increased Steaming Capacity
Maximum overload Capacity

Are Three Important Features of G. & McC. Co., Sectional Water-Tube Boilers.

So satisfactory was the installation shown that 2 more Boilers have since been ordered for the same plant.

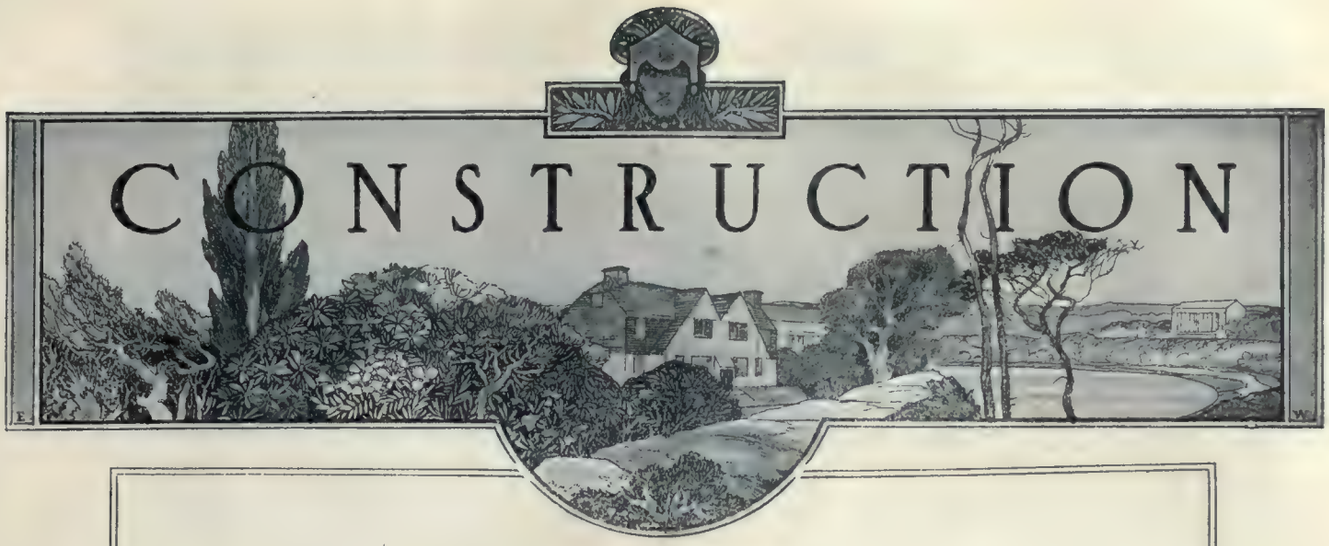
Ask for Catalog and further information

The Goldie & McCulloch Co., Limited
Head Office and Works, GALT, Ontario, Canada

TORONTO OFFICE: Suite 1101-2. Bank of Hamilton Bldg.
WESTERN BRANCH: 248 McDermott Ave., Winnipeg, Man.
QUEBEC AGENTS: Ross & Greig, 400 St. James St., Montreal, Que.
BRITISH COLUMBIA AGENTS: Robt. Hamilton & Co., Vancouver, B.C.

INDEX TO ADVERTISEMENTS

Anglin Norcross, Ltd. 358
Architectural Directory 65
Barrett Manufacturing Co. 55
Bishopric Mfg. Co.....Inside Front Cover.
B. C. Lumber Commission..... 61
Burlington Steel Co..... 64
Canadian Blower and Forge Co. 56
Canada Crushed Stone Corporation 59
Canadian General Electric Co.. 16
Canadian Johns-Manville Co... 9
Canada Metal Co., Ltd. 59
Canada Paint Co..... 10
Canada Wire & Iron Goods Co. 59
Carter Lead Co. 63
Conduits Co., Ltd. 18
Crane Ltd. 13
Dennis Wire & Iron Works Co., Ltd. 60
Dominion Bridge Co., Ltd..... ..... Inside Back Cover.
Dominion Paint Works 8
Galt Art Metal Co., Ltd. 56
Gillis & Geohegan 61
Goldie & McCulloch Co..... 68
Hamilton Bridge Co..... .....Outside Back Cover.
Interlocking Tile Co. 11
Jefferson Glass 7
Jenkins Bros., Ltd. 17
Kerr Engine Co. 61
Lord & Burnham 6
Ludowici-Celadon Co..... .....Inside Back Cover.
Mueller, H., Mfg. Co..... 5
National Conduit Co. 15
National Fireproofing Co..... 3
Nova Scotia Steel & Coal Co., Ltd.....Inside Back Cover.
Oakley & Son, George..... 57
Ornamental Iron & Bronze Works 57
Pedlar People 63
Reed, Geo. W. Co., Ltd..... 358
Reid & Brown Structural Steel & Iron Works, Ltd..... 63
Saturday Night Press 62
Sheldons, Ltd. 4
Slater Co., Ltd., N..... 61
Steel Co. of Canada..... 66
Stratford Mfg. Co. 59
Structural Steel Ass'n 12
Sturgeon, Limited 59
Toronto Plate Glass Co..... 57
Turnbull Elevator Mfg. Co. .. 14
Wallace Sandstone Quarries Ltd.....Inside Back Cover.



Toronto, December, 1921 Vol. XIV., No. 12

CONTENTS

NEW LIVE STOCK SHOW BUILDING, TORONTO 359

A BRIEF HISTORY OF THE COMPETITION FOR THE CANADIAN BATTLE-FIELDS MEMORIAL MONUMENTS 367

By Colonel H. C. Osborne, C.M.G., Honorary Secretary to the Commission.

BUILDING INDUSTRIES CONFERENCE AT HAMILTON 370

BRANCH OF BANK OF MONTREAL 371

DOMINION BANK (CITY HALL BRANCH) TORONTO 373

DOMINION BANK (YONGE & HAYDEN STREET, TORONTO) 373

CANADIAN SITKA SPRUCE 375

EDITORIAL 379

EXTENSION COURSE IN TOWN PLANNING AT UNIVERSITY OF TORONTO 379

WAR TIME AND PRESENT PRICE AND WAGE LEVELS 381

STANDARD MEDICAL AND SURGICAL CLINIC 383

HAMILTON CHAPTER (O.A.A.) DOINGS 387

MASTER MASONS HOLD CONVENTION 387

ONTARIO GOVERNMENT'S EFFORT TO STIMULATE BUSINESS 387

FRONTISPIECE:

NEW LIVE STOCK SHOW BUILDING, TORONTO 358

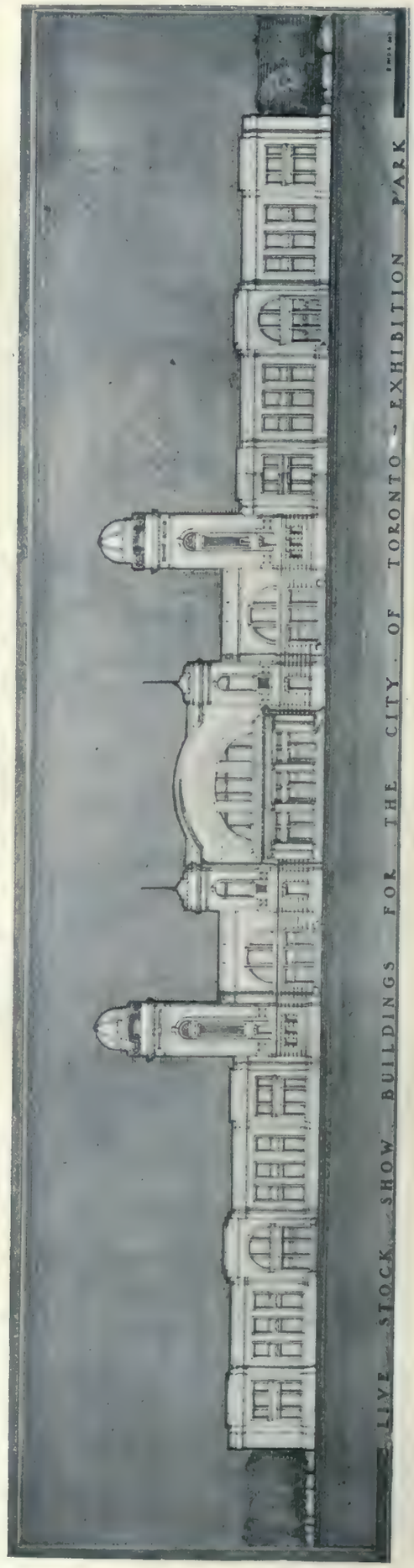
H. GAGNIER, Limited, Publishers

GRAPHIC ARTS BLDG., TORONTO, CANADA

BRANCH OFFICES

MONTREAL NEW YORK

PROGRESS VIEW, SHOWING BUILDING NEAR STAGE OF COMPLETION



MAIN ELEVATION

NEW LIVE STOCK SHOW BUILDING, CANADIAN NATIONAL EXHIBITION, TORONTO

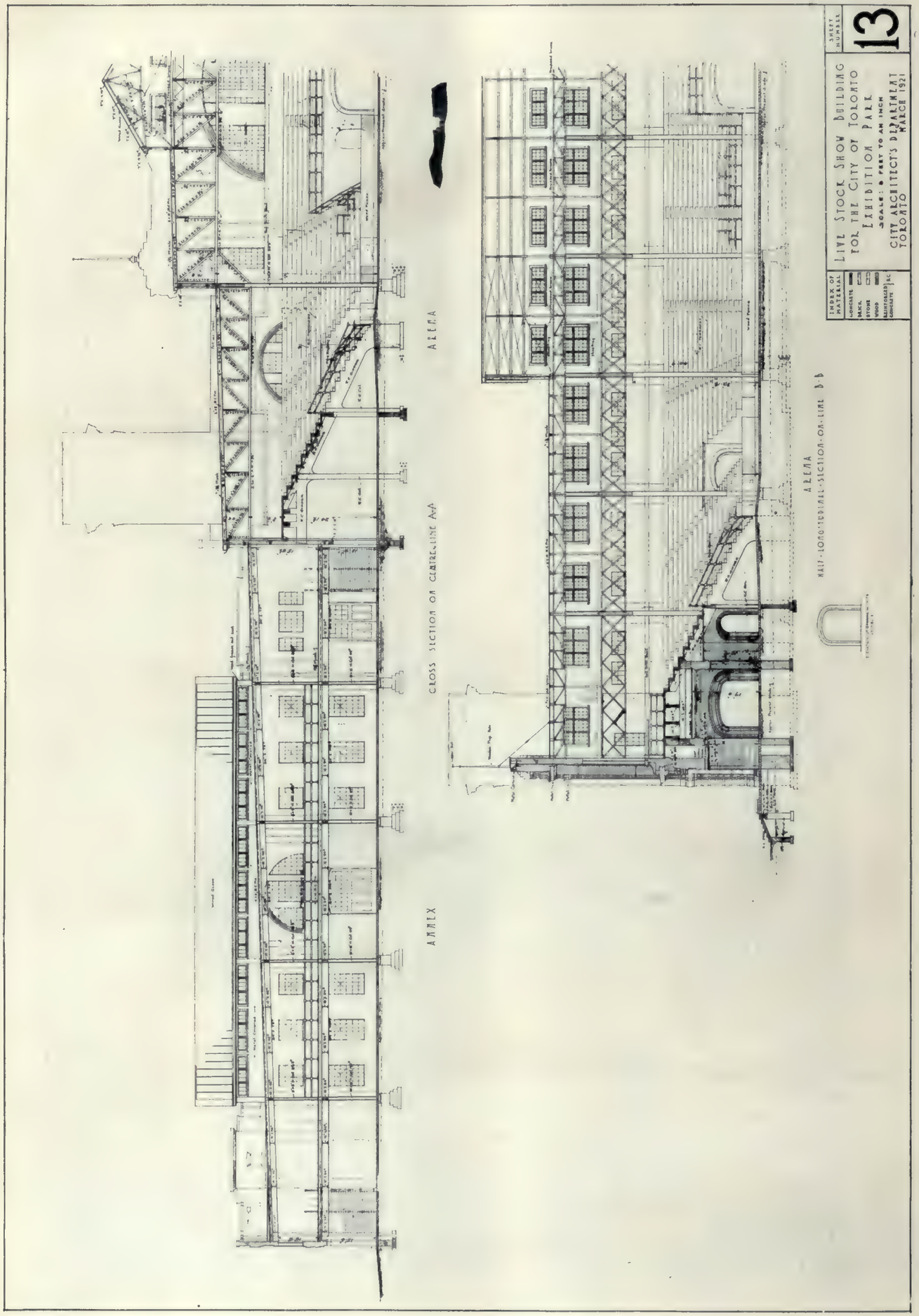
DESIGNED BY THE CITY ARCHITECT'S DEPARTMENT—K. S. GILLIES, CHIEF DRAUGHTSMAN.

The Live Stock Show Building, Toronto

THE latest addition to the already existing comprehensive group of buildings at the Canadian National Exhibition is the new Live Stock Show Building, now completed. This building has been erected to provide suitable accommodation for the live stock interests at the Exhibition and for the Royal Winter Fair which has become an important annual event. It will undoubtedly prove a great stimulus to the stock breeding not only in Ontario but throughout the entire Dominion, in that it gives the live stock industry facilities and accommodations for exhibiting and housing prize stock, unequalled by any other city on this continent. While intended chiefly to serve the agricultural interests, the structure is designed so that it can be utilized for various other purposes such as skating, automobile shows, athletic events and as a place of assembly for large meetings and conventions. In this latter respect it will fill a long felt want in view of Toronto's increasing prestige as a convention city, and already its importance has been emphasized in that the International Live Stock Show which has been held in Chicago for the past twenty years, will next year come to Toronto.

In providing funds for the building the City Council voted an appropriation of $1,000,000, and plans were prepared by the City Architect's Department in 1920 for its erection. The original plans called for the rehabilitation of the old horse stables at the west end of the building and the connection of same to the main scheme by an arcade. The arena in the main part of the building as contemplated at the time, was somewhat larger than the one just completed, and flanked with east and west annexes similar to the finished building. It was further intended to have an arcade connecting the east Annex to a group of buildings to be known as the judging building, cattle building, sheep building, and hog building. When tenders were opened, however, in November 1920, it was found that the appropria-

MAIN ENTRANCE TO ARENA.



CROSS AND LONGITUDINAL SECTIONS

NEW LIVE STOCK SHOW BUILDING, CANADIAN NATIONAL EXHIBITION, TORONTO

VIEW SHOWING ARENA AND SEATING ARRANGEMENT.

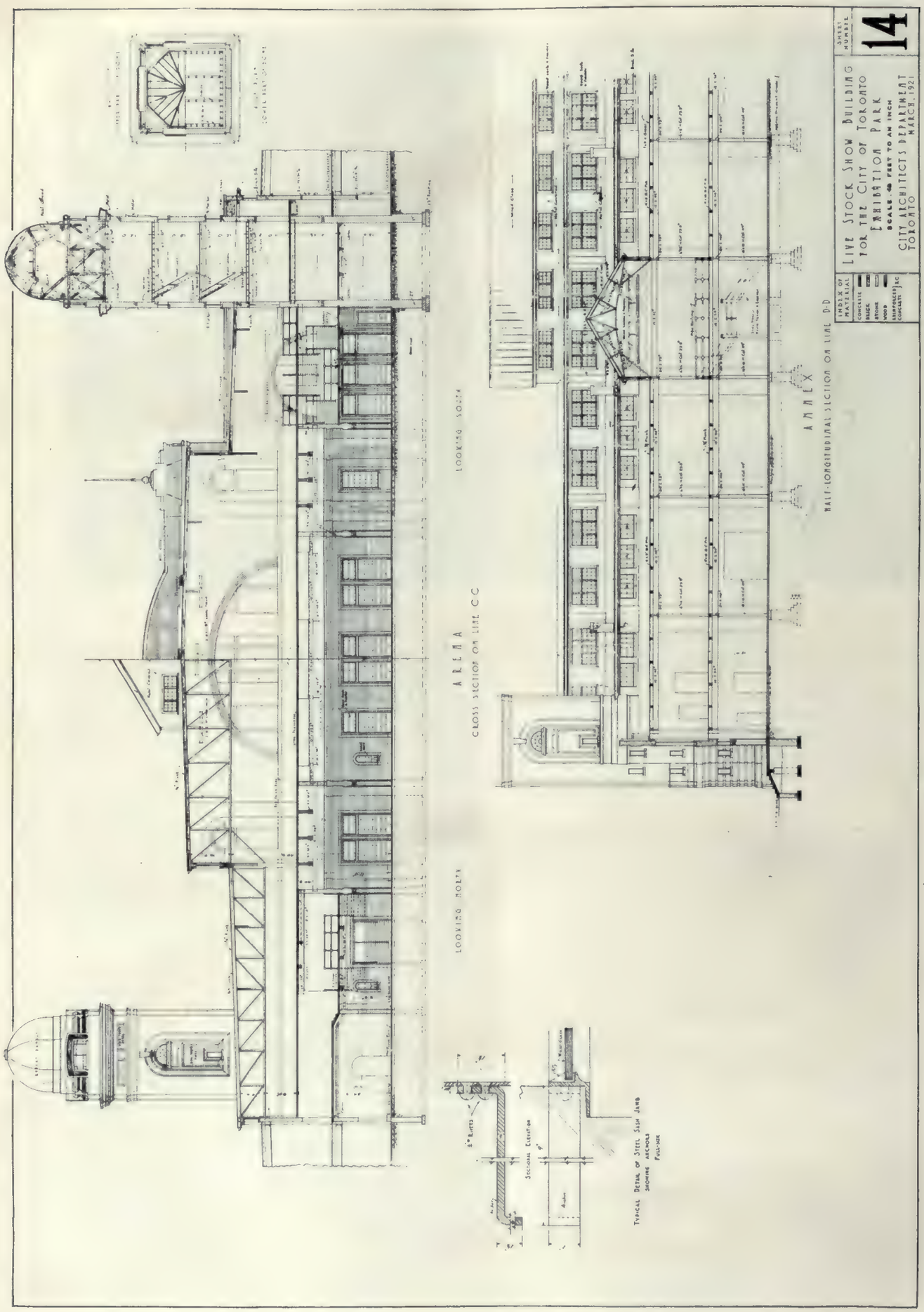
tion had been exceeded to an extent that it was necessary to eliminate some of the buildings in order to keep within the stipulated amount. Accordingly the plans were revised and new tenders called for.

Considering the delay caused on this account, and a still further delay occasioned by the controversy which arose as to whether the contract should be let to a local firm in preference to an outside bidder, despite a considerable difference in tenders, work on the building was very rapidly carried out. The contract was ultimately awarded to the lowest bidder at a price in the neighborhood of $900,000, or substantially below the sum granted. Taking into account the fact that the work did not start until the middle of May, the completion of the building within the specified time constitutes practically a record achievement.

The building, as it now stands, consists of the Arena and the East and West Annexes, the two annexes being practically identical in layout. On account of the fact that the appropriation provided did not allow of costly exterior treatment, ornamental brick-work was resorted to, with the exception of the entrance to the Arena which is treated in cut stone. The annexes are two-storey in height, 177 feet wide and approximately 338 feet long. The lower floor is constructed of concrete resting directly on the ground, and the second floor and roof are of timber construction supported on eighteen inch steel I—beams thirty feet long, about eleven feet on centre framing into twenty-four inch steel girder beams which frame into steel columns about thirty-six feet centre to centre, thus making a panel approximately thirty feet by thirty-six feet. There is no steel in the walls, the end of the steel floor and roof beams being carried on brick piers twenty-two and one-half inches thick by five feet, three inches long. Between piers is a thirteen and one-half inch solid brick curtain wall which carries no load whatever. There are two monitors, running east and west, to each annex thus assuring an abundance of light for any purpose to which this part of the building may be assigned.

The Arena proper is 237 feet wide and 370 feet long with a clear height of 40 feet, 9 inches under the main roof trusses. The large ring in the centre has a length of 200 feet and a width of 104 feet, the ends being rounded off to form a semi-circle. A small light fence has been constructed about this ring, the floor of which consists of rolled gravel. A promenade ten feet wide slopes up from the gravel floor to the first steps of the bowl which is composed entirely of concrete. The framework supporting the seats consists of sloping concrete girders 12 x 26 inches resting on two rows of square concrete columns reinforced vertically. The seats are made of three inch concrete treads spanning from the girders to the top of the next riser and reinforced with expanded metal. The risers vary in width from three inches to eight inches depending on the span between girders. They are figured as a concrete beam and are reinforced with two rods at the bottom.

On account of the size of the bowl it was thought advisable to provide for expansion or contraction due



CROSS AND HALF LONGITUDINAL SECTIONS
NEW LIVE STOCK SHOW BUILDING, CANADIAN NATIONAL EXHIBITION, TORONTO

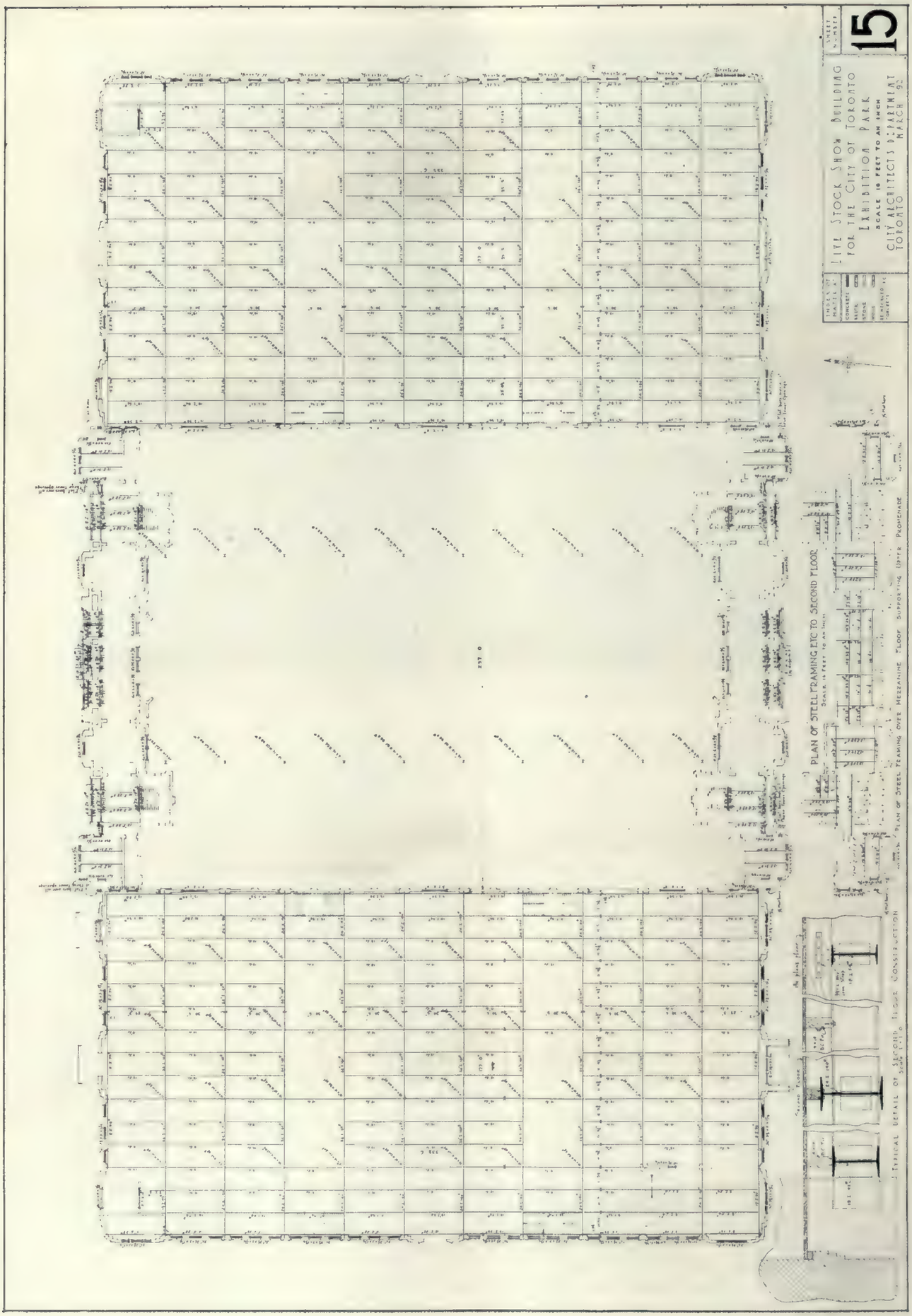
SECOND FLOOR (TYPICAL OF BOTH ANNEXES) NEW LIVE STOCK ARENA, CANADIAN NATIONAL EXHIBITION, TORONTO

to temperature changes. Accordingly eight expansion joints consisting of six thicknesses of roofing felt were specified, two in each side and two in each end. The joint was placed over the centre of the girders, the slab on one side being poured with the girder and the slab on the other side being free to slide on one half of the girder. An open space has been left at one end where a temporary stage may be constructed for the use of speakers or entertainers at any of the large gatherings that will take place from time to time. By placing chairs on the floor of the ring the seating capacity which is over seven thousand, can be practically doubled. There is also a large monitor running longitudinally over the centre of the Arena.

There only two lines of steel columns in the Arena, making two spans of 65 feet, 8 inches, and one of 106 feet, 4 inches, for the roof trusses. The columns which are situated between the promenade and the ring proper have an unsupported length of thirty-four feet, six inches, and are of the "built up" type consisting of a fifteen inch I—beam with a channel riveted to each flange. The flanges of the channels are turned in making a rectangular column twelve inches by fifteen inches. A considerable saving in the amount of shop work was effected by using this type of column in place of the usual plate and angle section which is generally adopted when a "built up" section is specified.

The roof trusses are of the general Pratt type. One end of the shorter span rests on the wall between the Arena and the annex at which point provision has been made to take care of any expansion or contraction that might result from changes in temperature. Slip bearings are provided by slotting the holes in the gusset plate of the truss through which the anchor bolts project. Both the bearing plate and gusset plate are planed smooth and graphite inserted between them. Bracing was employed in numerous ways to take care of wind stresses. The centre panel and the second from each end extending across the entire roof of the Arena, have diagonal bracing consisting of small trusses about two feet deep connected to the panel points of the large main trusses. There is also a truss six feet deep running between the column the full length of the Arena on both sides of the ring at an elevation slightly below the bottom chord of the long trusses. As a further protection against wind stresses a knee brace of two angles runs from the first panel point of the bottom chord of the main trusses to the columns supporting them.

To erect the steel work a traveller with two stiff leg derricks was placed in each building and the



PLAN OF STEEL FRAMING FOR SECOND FLOOR, INDICATING THE RELATIVE SIZE OF ARENA AND ANNEXES

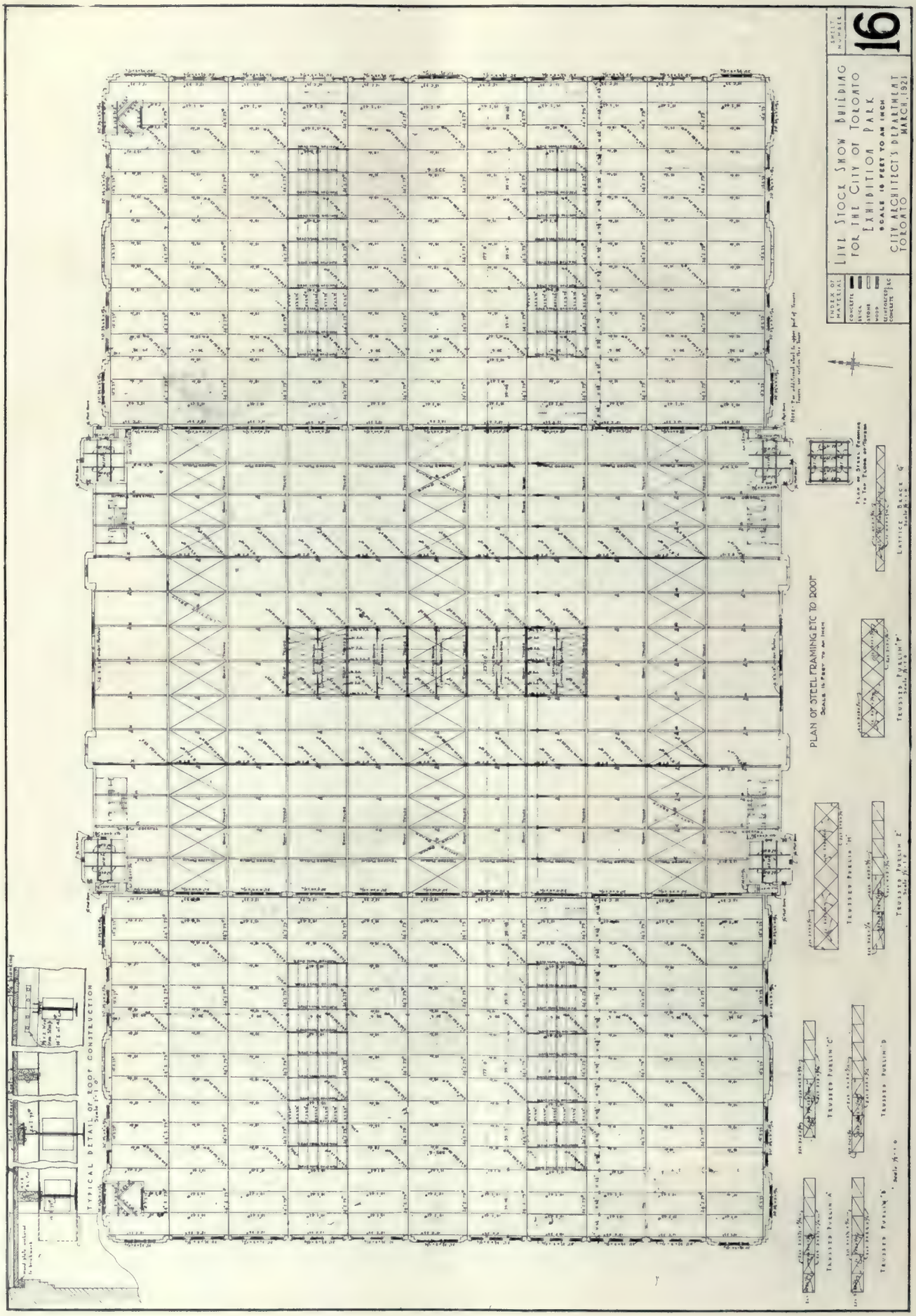
NEW LIVE STOCK SHOW BUILDING, CANADIAN NATIONAL EXHIBITION, TORONTO

steel was set up bay by bay as the travellers proceeded from the north to the south end. In this manner one or other of the two booms was able to set in place any piece of steel in the buildings. Approximately one thousand, six hundred tons of structural steel was used in the erection of the whole building; about five hundred tons in each of the annexes and the remainder in the Arena.

The completion of such an immense building in less than five months was a remarkable feat that could be accomplished only by the extensive use of structural steel. The fact that the building was spread over such a large area also contributed to the speed of erection in that a great many men could be employed on the work at the same time, but the factor that reduced the time of erection to a minimum was the use of structural steel for the framework of the annexes and the roof of the Arena. All this steel was erected in a space of forty-two working days.

VIEW SHOWING STARTING OF ROOF TRUSS AND ARRANGEMENT OF SEATS IN BACKGROUND (AUGUST 13TH)

ROOF TRUSS IN PROCESS OF ERECTION



PLAN OF STEEL FRAMING FOR ROOF, ETC.

NEW LIVE STOCK SHOW BUILDING, CANADIAN NATIONAL EXHIBITION, TORONTO

Some conception of the magnitude of the work involved may be obtained from the quantities of the more important materials that were used. These are as follows;— Structural steel, one thousand, six hundred tons; reinforcing steel, sixty tons; three million brick, four million feet of lumber, sixty thousand bags of cement. The perimeter of the building is one half mile and it covers approximately eight and one half acres of ground.

The plans for the building were prepared in the department of Mr. F. W. Price, City Architect, under the direction of Mr. K. S. Gillies, Chief Draughtsman. The general contractors for the building were Messrs. Anglin-Norcross, Limited. The fabrication and erection of the structural steel was carried out jointly by Messrs. McGregor & McIntyre, Limited, and the Dominion Bridge Company Limited.

NEW LIVE STOCK BUILDING, CANADIAN NATIONAL EXHIBITION, TORONTO, SHOWING STEEL TRUSS WORK OVER ARENA COMPLETED

The progress views shown were taken on August 13, 26 and 31 respectively and indicate the progress made in the erection of the steel work.

A Brief History of the Competition for the Canadian Battlefield Memorials

By Colonel H. C. Osborne, C.M.G., Honorary Secretary to the Commission.

THE erection of memorial monuments, on sites selected in 1919, both in France and Belgium, to commemorate the exploits of Canadian troops in the Great War, was first considered by Parliament in that year. In 1920 the matter was referred to a Special Committee of the House of Commons. Under the Chairmanship of the Honourable S. C. Mewburn, C. M. G., this Committee accepted the principle of erecting eight memorials at the following places:— St. Julien, Passchendaele, Observatory Ridge, Vimy Ridge, Dury Crossroads, Bourlon Wood, Courcelette, and Hospital Wood. The question whether to erect eight monuments of similar character or to give special importance to one in a central position, was considered, but was left for decision later. The Committee recommended "that a Competition in design open to all Canadian architects, designers, artists and sculptors should be held to determine the design or designs to be adopted." The Committee contemplated an expenditure of approximately $1,500,000. on road-making, sites, costs of competition, fees and construction, in the event of all monuments being of equal importance; it being anticipated that a greater expenditure might be required should it be decided to give special prominence to one of the monuments.

By Order in Council of 2nd September, 1920, P. C. 2146, the Canadian Battlefields Memorials Commission was constituted and the following were appointed thereto:—

(1) Major-General the Hon. S. C. Mewburn, C. M. G., K. C., M. P.
(2) The Honourable Rodolphe Lemieux, K. C., M. P.

(3) Lt. General Sir R. E. W. Turner, V. C., K. C. B., &c., &c.
(4) Lieut. Colonel R. W. Leonard.
(5) The Honourable J. G. Turriff.

Subsequently the Honourable S. C. Mewburn was elected Chairman of the Commission, Brigadier-General Hughes, C.M.G., D.S.O. was appointed as chief engineer to the Commission, and Mr. Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A., as architectural adviser, the writer being appointed Honorary Secretary.

In December, 1920, a "Competition in Design, open to all architects, sculptors and other artists in Canada" was inaugurated. The Conditions of the Competition were submitted to the Royal Architectural Institute of Canada and other professional bodies. A board of assessors whose ability and authority would be beyond question was provided by obtaining nominations from the Royal Architectural Institute of Canada, the Royal Institute of British Architects, London, and the Société Centrale des Architectes Francais, Paris. The architectural profession in three countries was thus responsibly represented by the following gentlemen— Mr. Frank Darling, L.L.D., F.R.I.B.A., R.C.A. for Canada, Professor C. H. Reilly, O.B.E., M.A., F.R.I.B.A., for Great Britain, and Mr. Paul P. Cret, Sc.D., S.A.D.G. for France.

In the first stage of the Competition, one hundred and sixty designs were submitted, anonymously, and examined by the Assessors. As a result, seventeen designers (chiefly architects and sculptors, as was to be expected) were invited to compete in the second or final stage of the Competition, each reseiving an honorarium of five hundred dollars ($500.) to defray the cost of a model he was required to submit.

On September 6th, 1921, the Assessors again met at Ottawa to study the models and make their recommendations, and, on October 4th the Commission met, opened the sealed report of the Assessors, and gave exhaustive consideration to its contents.

In the published Conditions of the preliminary Competition, Paragraph 24, it was stated as follows:-

"The aim of the Commission is the erection of a series of monumeants having a cumulative effect due to similarity in scale and general form as landmarks. Each monument should, however, be individual in character as to its base and the composition of its immediate precincts. Thus the visitor to the battlefields would readily recognize the characteristic Canadian monuments among the many to be erected—their value as landmarks is to be kept in view—some will be within sight of each other."

In the Conditions of the final Competition, Paragraph 20 reads as follows:-

"The aim of the Commission is the erection of a series of monuments having a cumulative effect due to repetition of general silhouette. Their value as landmarks is to be kept in view. The Canadian monuments should be readily recognizable as a widely distributed group among the many and varied monuments to be erected in France."

Report Of Assessors

The Assessors in their report, Paragraph 2, placed themselves on record as follows:—

"We are unanimously of the opinion that two of the designs submitted are of outstanding merit. They happen to be of the same general spirit and in this respect differ from the others, which vary considerably in their modes of expression. We therefore recommend, in view of paragraph 20, page 5, of the Conditions of the Final Competition, if the Commission desire to attain the cumulative effect mentioned therein, that these two designs should alone be executed.

"Of these designs, by Mr. Allward and Mr. Clemesha, that by Mr. Allward, which in our opinion is exceptionally fine and makes a very high appeal to the imagination, we suggest should be erected once only and should be placed on the site on Hill 62. It is a design suited to a low hill rather than to a continuous and lofty bluff or cliff like Vimy Ridge, where its delicacy of line would be lost in the mass of the ridge. On the Hill 62 site, moreover, it would be approached by the new road over a mile in length which the Commission has already made and from the top of the hill it would command the whole of the area of the Ypres Salient. It is, however, a design of such individuality and complexity that its character precludes it from the possibility of repetition elsewhere.

"On the other hand the design of Mr. Clemesha, while belonging to the same school of thought, is its exact opposite in this respect. It is of a very simple shape which can readily be used in several places and under varying conditions of site. Further it is the only design submitted to which this applies. Nevertheless its character is striking and highly individual. It is very unlikely that any other nation will erect a monument like it, a remark which could not safely be made of any of the designs submitted except these two.

"If these two designs only are used, as suggested, we feel strongly that not only will the desired cumulative effect be obtained but that the Commissioners will have erected for Canada a series of very distinctive monuments worthy in every respect to commemorate the great effort Canada made in the War."

Nature And Character Of Designs Selected.

After due consideration of the nature and character of the monuments which the carrying out of the Assessors' award would bring into existence, and having satisfied itself that the credit of Canada would be well upheld thereby, and that the award was in harmony with the principles enunciated by the parliamentary Committee and reiterated by itself in the Conditions for Competition, the Commission addressed itself to the matter of expenditure.

It was noted that Mr. Allward's complete design involving certain accessory retaining walls etc., was much in excess of the cubic contents called for, while what might be regarded as the substantive part of this design, consisting of double pylons, was moderate in this respect. The Commission took cognizance of the author's willingness to reduce the scale of the whole design and of the fact that, in view of the specific site (Hill 62) to which the Assessors allotted it on aesthetic grounds, the design for accessories might be considered as tentative.

Moreover, subsequent to the meeting of the Assessors, the Commission had received a communication from the Imperial War Graves Commission, looking to co-operation with the Canadian Battlefields Memorials Commission in the matter of commemorating the fourteen thousand Canadian missing. Acceptance of the Assessors' recommendation as to the placing of Mr. Allward's design lent itself, in the view of the Commission, to such a purpose.

The following is Mr. Allward's description of the symbolism he employs:—

"At the base of the impregnable wall of defence are the Defenders; one group showing the Breaking of the Sword, the

other the Sympathy of the Canadians for the Helpless. Above these are the mouths of guns, covered with olive and laurels. On the wall stands an heroic figure of Canada brooding over the graves of her valiant dead; below is suggested a grave, with helmet, laurels, etc. Behind her stand two pylons symbolizing the two forces,—Canadian and French—while between, at the base of these, is the Spirit of Sacrifice, who, giving all, throws the torch to his Comrade. Looking up, they see the figures of Peace; Justice, Truth, Knowledge, &c., for which they fought, chanting the Hymn of Peace. Around the figures are the shields of Britain, Canada and France. On the outside of the pylons is the Cross."

Another excerpt from Mr. Allward's notes is of interest as showing that his design should not be repeated:—

"I should like to explain that the pylons alone, with flanking groups, might be repeated, but feel that the design as a whole should not be used more than once."

Mr. Clemesha's notes are of particular interest and manifest no less conviction as to how the main object before the Commission could best be obtained. To quote:—

"I gather that the question of type is being left open until the models have been studied. Such being the case, it will be in order for me to offer the following suggestion:—

"That the best design be selected and erected on all sites without change as to the monument proper. I offer the following reasons:

"*Firstly,* that it is not possible to select eight subjects of equal merit in the opinion of everybody (not even, I submit, in the opinion of your judges), therefore, in allocating them you must discriminate.

"*Secondly,* this memorial stands for one idea, viz: pride in the achievement of our men; it should be symbolized by one thing, our best, and not an array of things.

"*Thirdly,* the fine feeling that dictated the policy of using the same cross and headstone in all military cemeteries applies here. We avoided the danger of appearing to say 'these dead are more honoured than those.' By the same means we shall avoid the danger that where a visitor may not like the monument on the site that interests his family, he shall not be able to say 'This achievement is deemed less glorious than that.'

"*Finally,* Is it not better that as time goes on people shall speak of *the* Canadian monument, rather than one of those monuments erected by the Canadians. The French are erecting a number of monuments from the same design.

"I have endeavoured to produce something big and very simple, suited to lonely country settings (as opposed to a more elaborate or classical treatment proper to a City). The thought that I would convey is Respect and Perpetual Remembrance. Simple lettering near the base on the sides might record facts of military and historic interest, with an inscription such as the following on the front:—

"Erected by the people of Canada to commemorate
"the endurance and achievements of her sons during
"the War of 1914-18."

"When we speak of the War and its losses we do not say so and so, or our men 'died upholding the torch of civilization,' or 'upholding the flag of their country' or 'Sacrificed themselves on the altar of their country'; such language is not current among us, and indeed would be quite distressing to the average Britisher, so I feel that it is neither good nor characteristic to use in our memorials. Indeed, is there not a danger that such passionate language and portrayal may even provoke a smile one hundred years from now. It would also be indicative of our normal attitude and refreshing to omit conventional emblems such as crown of victory, olive branch of peace, flags and torches, and use sparingly such words as valour, glory, immortal heroes and so forth, for those who were there know that we were not the sole exponents. I submit that only the entire absence of assertiveness, elaboration or suggestion of great cost can justify the size of our proposed memorial."

The result of the Commission's deliberations is embodied in the following resolution:—

The Commission having opened the sealed report of the Professional Assessors, and having examined and carefully considered its contents, is of opinion that the recommendation contained in Paragraph 2, providing for seven similar monuments from Mr. Clemesha's design and one monument of speial significance and magnitude from Mr. Allward's design, should be accepted.

1. The Commission has taken special note of the opinion of the Assessors that the design of Mr. Allward "is exceptionally fine and makes a very high appeal to the imagination" but that it is "a design of such individuality and complexity that its character precludes it from the possibility of repetition", also that the design of Mr. Clemesha "while belonging to the same school of thought ..... is of a very simple shape which can readily be used in several places and under varying conditions of site. Further it is the only design submitted, to which this applies. Nevertheless, its character is striking and highly individual. It is very unlikely that any other nation will erect a monument like it, a remark which cannot safely be made of any of the designs submitted, except these two."

2. The Commission feels that there is historical precedent for the erection of a series of monuments of similar form to mark the advance of Armies. Moreover, the adoption of this principle will signalize the national feeling that, having regard to the scale of operations and the importance of all the engagements to be commemorated, the efforts, sacrifices and triumphs of the Canadian Forces in the Field ought to receive equal recognition without discrimination as between one battlefield and another.

3. It is, also, felt that the erection but once of Mr. Allward's design is fully justified. The originality of thought and nobility of feeling which characterize it will in the opinion of the Commission ensure for it a very high place among the monuments to be erected in France and Belgium. The Commission considers that the opportunity now presented of giving adequate artistic expression to our peoples' most sacred sentiments should not be lost and that the placing of this monument within the historic battle area will achieve its end for present and future generations.

4. The Assessors have recommended a special site for this monument in the following words:

"We suggest (it) should be placed in the site on Hill 62. It is a design suited to a low hill rather than a continuous lofty bluff or cliff like Vimy Ridge, where its delicacy of line would be lost in the mass of the ridge. On the Hill 62 site, moreover, it would be approached by the new road, over a mile in length, which the Commission has already made, and from the top of the hill it would command the whole of the area of the Ypres Salient."

The Commission having considered, in consultation with its chief Engineer and Architectural Adviser, the physical aspects of the other sites, concurs in this opinion. The placing of Mr. Allward's monument once at this point is further supported by the following considerations:—

(a) The site is an accessible one. It is central. It will always be visited.

(b) The Canadians missing throughout the battle area number some fourteen thousand. Of these the majority lie within the Salient. The commemoration of these missing (involving the inscription of 14,000 individual names) will be most impressively achieved if concentrated. The design in question lends itself to this use.

(NOTE—At this meeting the Commission had before it certain suggestions from the Imperial War Graves Commission looking to co-operation with the Canadian Battlefields Memorials Commission with a view to commemoration of Canadians missing in connection with the scheme for Canadian Battlefields Monuments.)

In due course a formal report containing the recommendations of the Commission was made to the Honourable The Minister of Militia and Defence, and by him submitted to the Governor General in Council. This was accepted and approved by His Excellency on October 17th (Order in Council, P.C. 3944).

At a subsequent meeting on Oct. 4th, the Commission took note of the observations of the Assessors regarding the various designs submitted and directed that prizes of $1,000. each should be awarded to: Mr. Cecil Burgess, Ottawa; Mr. Kenneth G. Rea, Montreal; Mr. S. D. Ritchie, Montreal; Mr. P. R. Wilson, Montreal; and that honorariums of $300 each should be granted to all other competitors in the second stage of the competition.

The matter is therefore *en train* and the Commission is equipped with the necessary powers to proceed with the erection of these monuments, subject of course to the provision of the necessary money from item to time by Parliament.

While the Competition in Design was proceeding, the Engineers of the Commission, under the direction of Brig. General H. T. Hughes, C.M.G., D.S.O., were engaged in acquiring and clearing sites and constructing a permanent road slightly over a mile long from a point on the Ypres-Menin Road near Hooge to Hill 62. The Horticultural Officer, Lt.-Colonel M. N. Ross, D.S.O., has spent the past year in creating nurseries for subsequent tree-planting and generally studying the character of the soil and other local conditions with a view to horticultural treatment of the various sites.

The Canadian Battlefields Memorials Commission realizing its great responsibility, both to the Canadian public of today and to posterity, will facilitate the fullest study of the problem before them, by the fortunate artists entrusted with the work. An experimental model of Mr. Allward's design will be erected in canvas and plaster on Hill 62 before working drawings are made, and Mr. Clemesha will be afforded opportunity of experimenting in Canada in a similar way. The actual scale upon which the designs will be carried out will not be decided upon until these models have been completed.

Building Industries Conference to be Big Event

Judging from present indications the conference of the Association of Canadian Building and Construction Industries to be held in Hamilton from January 17—20, is shaping into a big event and will be record breaking from the point of attendance. It is expected that delegates will be present from all parts of Canada, for in spite of the depression which has existed in many of the construction activities there is a general feeling that this will soon come to an end and a new era of activity commence. It will be with this spirit that the conference will convene and discuss the problems which are bound to arise as soon as financial conditions become favorable for construction work.

A new feature of this fourth Conference will be an exhibit of the products of the manufacturing and supply members of the association. The meetings are to be held in the large ball room of the Royal Connaught Hotel and space is being allotted around the walls of this large room and the gallery at the back for the exhibition of the products and advertising matter. This exhibit is in charge of the Secretary of the Hamilton Association, Mr. E. B. Osborne, (36 James St. South) and promises to be one of the most successful features of the conference.

Another departure from previous conferences will be a greater emphasis upon the educational value of the sessions to the members. Arrangements are now being made for addresses by experts on some of the very practical questions which face the contractor and the sub-contractor in his endeavour to get business and to execute it without incurring a loss. It is also expected that there will be a speaker of outstanding importance who will give one or more addresses on some of the economical aspects of construction followed by a round table discussion.

The daily luncheons, which have been such an enjoyable feature of the past conferences will again be held each day and the programme has been left in charge of the Hamilton Association, which means that there will be live and interesting speeches, community singing, and other special features. Time will also be given between the sessions for special entertainment and if the weather is favorable it is hoped there will be an afternoon of Curling.

During the conference arrangements will be made for visits to a number of plants of firms manufacturing building materials as well as to other places of interest. In this connection a motor trip will be taken to Aldershot, just east of Hamilton, where as guests of the National Fireproofing Company the delegates will be taken through the company's plant and shown the process under which hollow tile is manufactured.

The programme of the conference, it is understood has been completed, and is at present being mailed out to all identified with the association's activities.

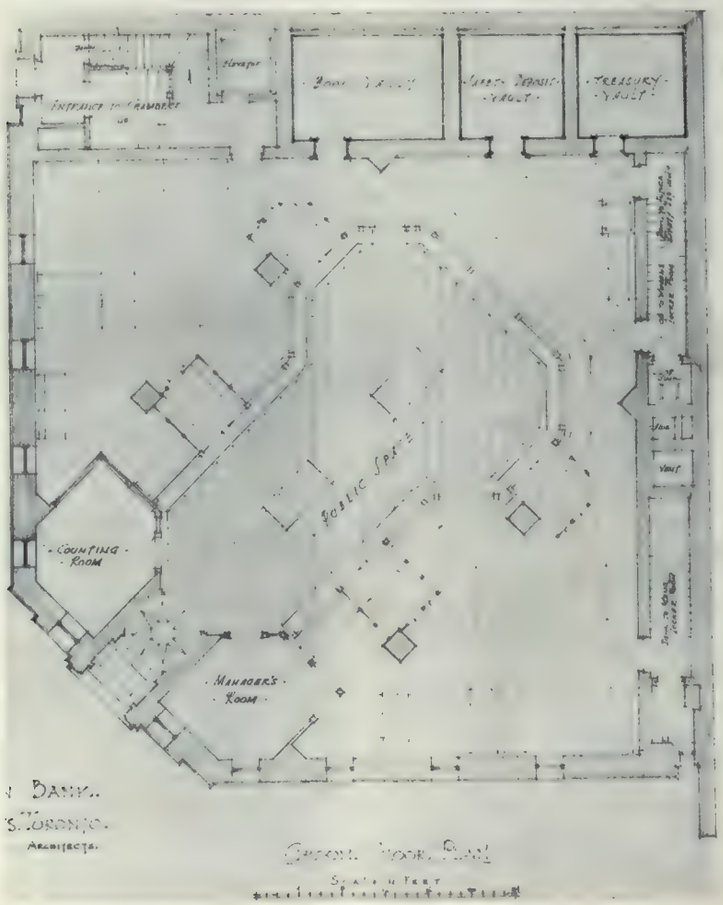
DETAIL OF ENTRANCE

BRANCH OF BANK OF MONTREAL, CHERRY AND VILLIERS STREETS, TORONTO

DARLING AND PEARSON, ARCHITECTS

BANK OF MONTREAL, CORNER CHERRY AND VILLIER STREETS, TORONTO

DARLING AND PEARSON, ARCHITECTS



(See Opposite Page)

GROUND FLOOR PLAN, DOMINION BANK (CITY HALL BRANCH), TORONTO

DARLING AND PEARSON, ARCHITECTS

BANKING ROOM

EXTERIOR VIEW
DOMINION BANK, CITY HALL BRANCH, TORONTO
DARLING AND PEARSON, ARCHITECTS

BRANCH AT YONGE AND HAYDEN STREETS

DOMINION BANK, TORONTO

DARLING AND PEARSON, ARCHITECTS

BANKING ROOM

Canadian Sitka Spruce

THE Dominion Forestry Branch has just issued a bulletin entitled "Canadian Sitka Spruce,–Its Mechanical and Physical Properties" which was prepared by Loren L. Brown, recently superintendent of the Forest Products Laboratories of Canada at Vancouver, B.C., and now British Columbia Lumber Commissioner for Eastern Canada with headquarters at No. 1 Adelaide St., East, Toronto. This bulletin should be of interest to all users of softwoods, as Sitka Spruce possesses characteristics which make it valuable not only in building construction, but also to the factory trade. It can be obtained on application to the Director of Forestry, Department of the Interior, Ottawa.

Sitka spruce acquired fame during the war on account of its wide use in aeroplane manufacture. Because of its great strength, toughness and lightness, ease of conditioning and working, and the fact that great sizes and lengths can be obtained in absolutely clear and straight grained material it is the wood "par-excellence" for aeroplane construction.

Sitka spruce, was, however widely known in the West before the war and is now becoming very popular in the East. It is put to the following uses: Sounding boards, back posts and ribs for pianos; bodies for violins and other stringed instruments; pipes for organs; wagon sides and bottoms; mixing boards; kitchen tables, childrens' toys, boats and oars, billiard table frames, wind-mill wheel slats and poultry brooders, cooperage, boxes, trunks and veneers, caskets, sash and doors, ice-cream tubs, tank stock, core stock, building framing, sheathing and interior finish.

This growth is found along the Pacific Coast from Northern California to Alaska, seldom extending back more than fifty miles from salt water and reaching its best growth in constantly moist, deep, rich soils in a humid atmosphere. It is generally distributed throughout the Western slope of the coast mountains and on Vancouver and Queen Charlotte Islands.

"Sitka spruce is one of the largest trees on the Coast, attaining a diameter of from 8 to 12 feet and a height of from 160 to 180 feet. Ordinarily it is from 3 to 6 feet in diameter and 100 to 125 feet high. When grown in fairly dense stands the trunk is usually clear for from forty to eighty feet and it tapers very little till the branches are reached. Single trees contain from 8,000 to 10,000 ft. b.m., and occasionally as much as 15,000 feet b.m. It seldom occurs in pure stands but, in mixture with hemlock and balsam, or with cottonwood, it frequently runs from 40 to 60 M. per acre."
("Forests of British Columbia",—H. N. Whitford and R. D. Craig.)

Interesting information is contained in the bulletin mentioned regarding the effect of moisture content on the strength of Sitka spruce, and also on the relation between the strength of the wood and its density. To quote from the bulletin:

"The effect of moisture content upon the strength of Sitka spruce was determined by selecting test specimens from the four feet bolt adjacent to the one used for green tests. Specimens were selected at equal distances from the pith and either soaked in water or dried to obtain moisture contents ranging from the water-soaked condition to the oven-dry condition."

Considerable difficulty was experienced and constant vigilance required in obtaining the exact moisture content desired in these sticks, due to the following facts:

The lighter wood near the pith dries out much more rapidly than the dense wood near the periphery and contains a much lower percentage of moisture.

The moisture content of even a small stick varies several per cent in a few feet.

The sticks lose weight rapidly in warm, dry weather and gain in humid atmosphere.

At these different moisture conditions compression parallel and static bending tests were made and a curve drawn from the series from each bolt. The material for each curve was comparable in that it was from the same bolt and equi-distant from the pith; the results are shown in Figures 12 and 13 of the pamphlet. From these figures it is seen that as Sitka spruce is dried below 31 per cent of moisture on the basis of the oven-dry weight of the wood, its

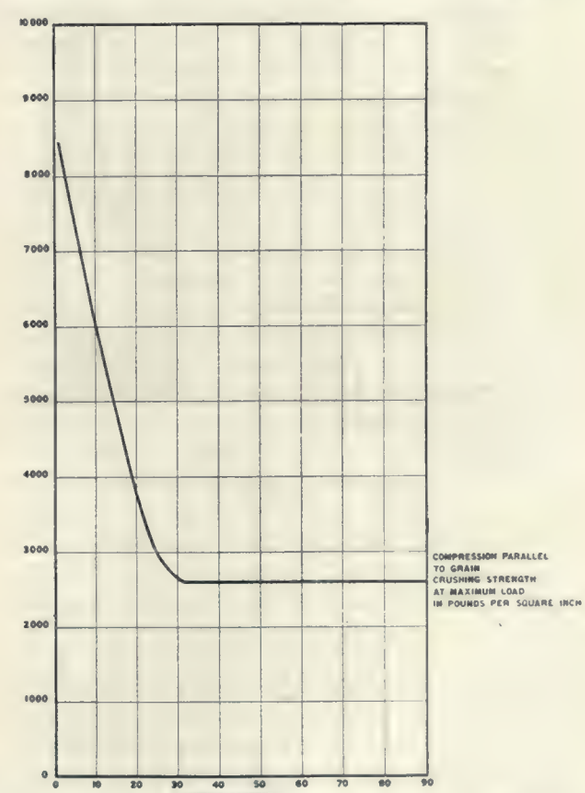


Fig. 13 Relation of the moisture content, based on the weight of wood when oven-dry, per cent, to the compressive strength at maximum load, compression parallel grain, pounds per square inch

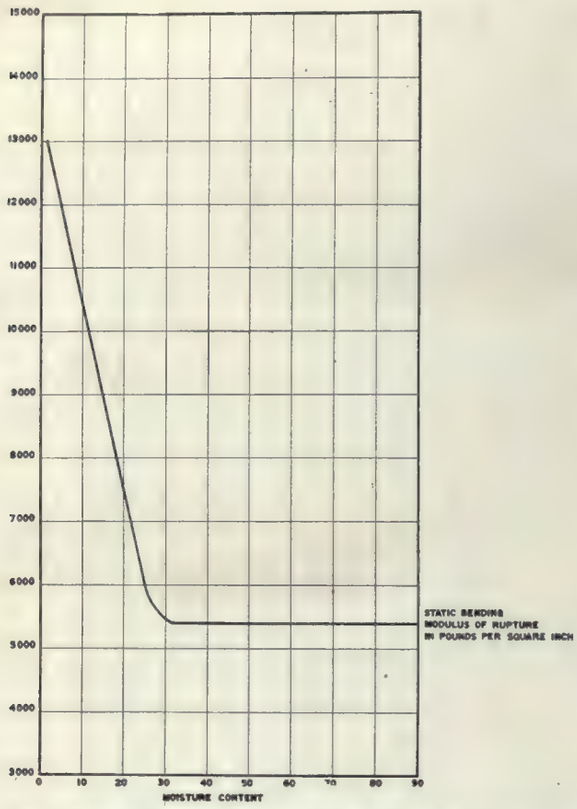


Fig 12 Relation of the moisture content, based on the weight of wood when oven-dry, per cent, to the modulus of rupture in static bending, pounds per square inch

strength increases, but that any increase of moisture content above 31 per cent does not affect the strength. This point is called the fibre-saturation point and the theory is that any moisture above this percentage is simply held in the fibres and inter-cellular spaces as water in a sponge or imbibed water, but that any water removed from the wood decreasing the percentage of moisture below this point is drawn from the fibre walls and results in strengthening the wood.

This curve readily shows that it is dangerous to compare the strengths of wood tested at varying moisture contents if below their fibre-saturation points, but that they can be safely compared if their moisture content is above this point, even though their moisture contents vary appreciably—say from the fibre-saturation point to the water-soaked condition. Therefore, the majority of these tests were performed on green material as it is difficult to exactly control the moisture content of wood.

The curves shown in figures 12 and 13 indicate that the crushing strength in compression parallel to grain increases with decrease of moisture up to the oven-dry condition, but that the modulus of rupture in static bending either suffers a slight decrease or increases at a slightly diminished rate, due to the extraction of the final two or three per cent of the moisture, which seems to render the wood brittle.

The main value of these curves lies in the fact that with them the strength of two pieces of different moisture content can be compared if their moisture contents lie between 10 per cent and 20 per cent of oven-dry weight by increasing or decreasing their strength function due to drying. By taking as a base the strength function at 15 per cent of moisture it will be seen that for every one per cent of moisture content, the modulus of rupture in static bending should be increased or decreased approximately 3.5 per cent and for maximum compressive stress, compression parallel to grain, 5 per cent. These results are, of course, only approximate, but are exact enough be of real assistance.

It was found that the moisture percentage of Sitka spruce varied greatly, the minimum, about 27 per cent, being found in the heartwood, and the maximum, about 230 per cent, in the sapwood. This green sapwood, with a very high moisture content, is approximately only 85 per cent as strong as the adjacent heartwood in compression parallel to grain tests, fibre stress at elastic limit and modulus of rupture for static bending tests, but when dried down to the air-dry condition it is fully as strong as the adjacent heartwood. No sapwood was included in the material used for the moisture strength curves and comparatively few tests were made on it altogether, owing to the narrow ring of sapwood in Sitka spruce.

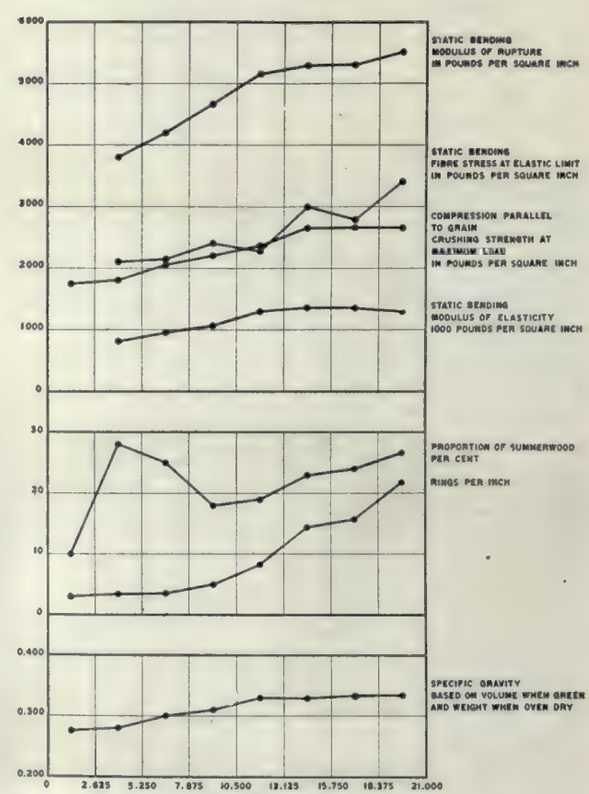


Fig. 15 Curves showing the characteristic variation of physical and mechanical properties with distance from the pith for Tree 2, Shipment 53

The effect of air-drying Sitka spruce to approximately 12 per cent was determined by tests on one of the five trees from each shipment. Two contiguous bolts were taken from this tree and half the sticks of one inter-changed with half of those from the other, in order to correct any defect due to difference in height in the tree. One of these com-

TABLE 6—Results of tests on small clear specimens of Sitka spruce from three localities in British Columbia. Average strength values green and air-dry for the three shipments with percentage increases in strength due to drying.

Abbreviations: A=air-dry; av.=average; comp.=compression; G.=green; in.=inch; in.-lb.=inch-pounds; max.=maximum; M lb.=1,000 pounds; para.=parallel; perp.=perpendicular; rad.=radial; ship.=shipment; surf.=surface; S. G.=specific gravity; tan.=tangential; vol.=volume; wt.=weight.

Shipment No. and Locality where grown	Seasoning	No. of trees tested	Rings per in.	Proportion of summerwood	Shrinkage: Volumetric shrinkage to oven-dry condition based on green vol.	Shrinkage: Linear shrinkage from green to oven-dry condition, based on green dimensions: Rad.	Shrinkage: Linear shrinkage from green to oven-dry condition, based on green dimensions: Tan.	S. G. based on wt. when oven-dry, and, on vol. when tested	S. G. based on wt. when oven-dry, and, on vol. when oven-dry	Wt. per cu. ft. as tested	Moisture content based on wt. of wood when oven-dry	Static Bending: Fibre stress at elastic limit, per sq. in.	Static Bending: Modulus of rupture, per sq. in.	Static Bending: Modulus of elasticity, per sq. in.	Static Bending: Work in bending per cu. in. of specimen: To elastic limit	Static Bending: Work in bending per cu. in. of specimen: To Max. load
				%	%	%	%			Lb.	%	Lb.	Lb.	M-lb.	In.-lb.	In.-lb.
51—Kings	G.	5	8·1	20	11·7	4·2	8·5	0·324	0·367	30	46·3	2,864	5,139	1,369	0·34	4·53
	A.	.....	.....	.....	.....	.....	.....	0·373	.....	26	13·3	5,528	9,296	1,565	1·12	9·51
52—Thurston Harbour	G.	5	18·3	25	12·2	4·8	7·5	0·372	0·424	32	38·5	3,372	5,768	1,456	0·45	4·84
	A.	.....	.....	.....	.....	.....	.....	0·391	.....	27	11·8	6,906	10,705	1,717	1·59	9·42
53—Masset Inlet	G.	4	11·6	22	11·2	4·4	7·6	0·347	0·390	31	44·5	2,985	5,332	1,263	0·42	5·18
	A.	.....	.....	.....	.....	.....	.....	0·370	.....	26	12·8	6,516	9,976	1,625	1·45	9·16
STRENGTH FUNCTIONS, AIR-DRY, EXPRESSED AS PERCENTAGES OF GREEN VALUES																
								%		%	%	%	%	%	%	%
51—Kings	.....	.....	.....	.....	.....	.....	.....	115·1	.....	86·6	13·3	193·0	180·9	114·3	329·4	209·9
52—Thurston Harbour	.....	.....	.....	.....	.....	.....	.....	105·1	.....	84·4	11·8	204·8	185·6	117·9	353·3	194·6
53—Masset Inlet	.....	.....	.....	.....	.....	.....	.....	106·6	.....	83·9	12·8	218·3	187·1	128·7	345·2	176·8
Av. for the three shipments	.....	.....	.....	.....	.....	.....	.....	**105·9**	.....	**85·0**	**12·6**	**205·1**	**184·5**	**120·3**	**342·6**	**193·8**

Shipment No. and Locality where grown	Seasoning	Impact Bending: Fibre stress at elastic limit, per sq. in.	Impact Bending: Work in bending to elastic limit, per cu. in. of specimen	Impact Bending: Height of drop of 50-lb. hammer causing complete failure of specimen	Compression parallel to grain: Compressive stress at elastic limit, per sq. in.	Compression parallel to grain: Crushing strength at max. load, per sq. in.	Compression perpendicular to grain: Compressive stress at elastic limit, per sq. in.	Hardness: Load required to imbed a 0·444-inch sphere of steel to one-half its diameter: Rad surf.	Hardness: End surf.	Shearing parallel to grain: Shearing strength per sq. in. the plane of failure being, Rad.	Shearing: Tan.	Cleavage: Splitting strength per in. of width of specimen 3 in. long, the plane of failure being, Rad.	Cleavage: Tan.	Tensional perpendicular to grain: Tensile strength per sq. in. the plane of failure being, Rad.	Tensional: Tan.
		Lb.	In.-lb.	In.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
51—Kings	G.	6,712	1·78	19	2,081	2,440	246	282	371	543	620	127	163	196	280
	A.	9,605	2·90	21	2,959	4,931	361	424	613	680	598	121	171	..	..
52—Thurston Hr.	G.	7,294	2·02	17	2,106	2,707	329	356	436	645	688	155	193	325	395
	A.	11,277	3·55	24	3,774	5,912	717	459	765	1,137	1,212	266	212	337	391
53—Masset Inlet	G.	7,541	2·03	20·1	2,006	2,518	299	330	411	651	670	167	174	320	332
	A.	10,188	2·79	20·4	2,897	5,217	604	415	774	1,179	995	230	303	122	394
STRENGTH FUNCTIONS, AIR-DRY, EXPRESSED AS PERCENTAGES OF GREEN VALUES															
		%	%	%	%	%	%	%	%	%	%	%	%	%	%
51—Kings	.....	143·1	162·9	110·5	143·6	202·1	187·4	150·3	165·2	125·2	96·5	95·3	104·9	...	.
52—Thurston Hr.	.....	154·6	175·7	120·0	179·2	218·4	217·9	128·9	175·5	175·5	176·2	171·6	109·8	103·7	99·8
53—Masset Inlet	.....	135·1	137·4	101·5	144·4	207·2	202·0	139·1	188·3	181·1	148·5	137·7	174·1	131·9	118·7
Av. for the three shipments	.....	**144·3**	**158·7**	**110·7**	**155·7**	**209·2**	**202·4**	**139·4**	**176·3**	**160·6**	**140·4**	**134·9**	**129·6**	**117·8**	**109·3**

posite bolts was tested green, the other air-dried to 12 per cent moisture content and tested.

The average strength values air-dry, as shown in Table 6, are the result of applying the ratio of each function for air-dry and green material for this one tree to the average green values for the entire shipment.

It will be seen by referring to Table 6 that the increase of the strength functions due to their air-drying varied considerably, ranging from approximately 230 per cent in the case of work to elastic limit, static bending, 100 per cent in the case of fibre stress at elastic limit, static bending, and compressive stress at maximum load, compression parallel to grain, to a slight increase in the case of cleavage and tension.

RELATION BETWEEN THE STRENGTH OF WOOD AND ITS DENSITY.

Figure 14 shows very clearly the fact that the strength of Sitka spruce varies with its specific gravity oven dry, i.e., of two sticks of Sitka spruce of equal volume, the stronger one will be the heavier, provided they are of the same moisture content.

"This specific gravity is based on the weight of the sticks oven-dry and their volume when tested. A specific gravity, which never exists in fact, but which affords a very convenient method of comparing the densities of wood, especially that of a moisture content higher than the fibre saturation point, as the volume of a stick of wood is unchanging at any moisture content above that point. True specific gravities are also determined for green, air-dry and oven-dry material for each tree by the water displacement method described in the appendix to Bulletin No. 60."

In this curve each tree of the three shipments is arranged in the order of its modulus of rupture and it is seen that this curve is closely parallel by that for the specific gravity.

Figure 15 also illustrates the fact that the strength of Sitka spruce is proportional to its density and that

its density, or specific gravity, is related to the percentage of summerwood.

Investigations of other woods have revealed the fact that their greatest strength is associated with a fairly definite number of rings per inch. (In the case of Douglas fir, 12 to 16 rings per inch,—U.S. Forestry Service Bulletin No. 88) This relationship does not, however, hold true in the case of Sitka spruce, which seems to have its greatest strength associated with a number of rings per inch varying from 12 to 35, but which is almost invariably the greatest number of rings per inch in that particular tree from which the stick is taken. In shipment 51, from the lower mainland of British Columbia, the number of rings per inch associated with the maximum strength is about 12, whereas in the two shipments from the Queen Charlotte Islands the number of rings per inch associated with the greatest strength for the ten trees varied from 15 to 35.

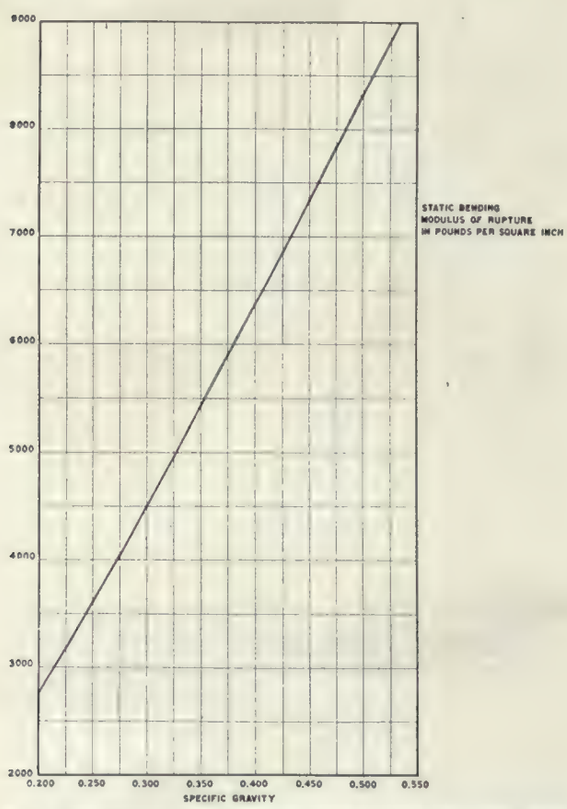


Fig 16 Curve showing the relation between the modulus of rupture, static bending, pounds per square inch, and the specific gravity, volume green and weight oven-dry, based on the results of tests of small, clear specimens of three shipments of Sitka spruce
(Modulus of rupture, pounds per square inch=M Specific gravity, based on volume green and weight oven-dry=G Relation $M=21620\ {}^{10}\sqrt{G^{13}}$

Figure 16 shows how closely the strength of Sitka spruce varies with its density and shows a method by which it may be definitely sorted into different grades with respect to its strength. This should be especially useful in connection with aeroplane manufacture where very definite strengths are required. It would be a simple matter to make a specific gravity test of each plank before it goes into manufacture, thereby eliminating with exactitude all inferior material. By referring to Figure 16 it will be seen that over 99 per cent of clear green Sitka spruce with a specific gravity of .300 can be depended upon to have a strength greater than 4,000 pounds per square inch in modulus of rupture, static bending; that more than 97 per cent of the material with a specific gravity of .350 has a modulus of rupture greater than 5,000 pounds per square inch; that 90 per cent of material having a specific gravity of .400 has a modulus of rupture greater than 6,000 pounds per square inch. Drying to 12 per cent moisture would increase the modulus of rupture by approximately 85 per cent.

Sitka spruce can be graded by this means, the weaker material culled and the better grades used with a factor of safety according to their strengths; also a more scientific design, economy of material and a greater safety will result.

One of the recent notable examples of the use of Sitka spruce is to be seen in the newly completed Electrical Building at Toronto University, all of the finish of which is Sitka spruce, stained in oak. Some of the largest sash and door manufacturers in the East are using it extensively and it has proved very popular with furniture manufacturers for drawer sides and bottoms, backing up and for core stock. For ladders, where strength is an important factor, manufacturers have found it very suitable, as it can be obtained in long clear lengths and is stronger than any of the other spruces, works well and does not split or splinter. One of the best known wagon manufacturers in Canada is using Sitka for wagon sides and bottoms.

This bulletin may be obtained free by application to the Forest Products Laboratories of Canada, 700 University Street, Montreal, or to the Director of Forestry, Forestry Branch, Department of the Interior, Ottawa.

Facts About Canada

Few people realize that 26,445 Canadian ex-service men have been established on the land and are nearly all making good; that Canada's waterpower development represents an investment of $475,000,000, while the power produced would otherwise require 18,000,000 tons of coal yearly; or that nearly 88 per cent of the world's supply of asbestos comes from the Province of Quebec. The Natural Resources Intelligence Branch of the Department of the Interior, has just issued a revised edition of "Compact Facts," which contains in concise form, information regarding Canada; its area, population, trade and industries; their extent, capital invested, wages paid, values of live stock, principal crops and amounts produced; mineral resources and present production; also forest resources and forest products; Copies of the booklet are available on application to the Superintendent, Natural Resources Intelligence Branch, Department of the Interior, Ottawa.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

H. GAGNIER; LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets.

TORONTO, - - - - - CANADA

M. B. TOUTLOFF, Editor

W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:

MONTREAL—171 St. James Street
E. J. Shearman, Representative.

WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue
F. Watson, Representative.

CHICAGO—1011 Hartford Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned. Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, December, 1921 No. 12

Compliments of the Season

The season of the year is at hand when it is time to do service to the time honored custom of extending felicitations, and we therefore most cordially and sincerely wish our readers all which the sentiment of the season implies. Despite the fact that the twelve months coming to a close were beset with many uncertain elements and setbacks, it was not such a bad year after all. Indeed, in view of recent events such as the disarmament conference with its succesful outcome, and the pending settlement of the Irish question, it was a year in which much was accomplished toward a return to that "peace on earth" which gives the Christmas spirit its real significance.

With the great sums of money expended on naval rivalry diverted to more legitimate uses, and with the prospect of some mutual agreement or concessions on the part of the allied countries in regard to the cancellation of their war time debts, benefits are bound to eventuate which will shortly reflect themselves in business conditions and bring us closer to a realization of more normal times. The whole tendency of the moment is towards a more optimistic outlook. Therefore the "Merry Xmas and Happy New Year" greeting this year has more of its old time meaning. As regards the construction field it at least can be said that there is more big work in evidence than for several years. This is manifest in the considerable amount of hotel, office building and school work under way or proposed, and with more encouraging reports from architects regarding spring prospects, it altogether constitutes a wholesome sign on which we can not only base our hopes, but which promises a fuller realization of business expectations.

Extension Course in Town Planning

The short course in town planning to be conducted by the University of Toronto from January 9—21 inclusive, will undoubtedly make a strong appeal to members of town planning commissions, architects and others interested in the solution of town planning problems.

The subjects to be dealt with include historical and general phases of town planning together with its economic aspects, surveying, zoning, housing and health, sunlight planning, street transportation and the legal powers of municipalities. It is understood that the intention is to have two lectures followed by discussions on each morning of the two weeks, and to devote the afternoon periods to the study of actual problems.

In providing this course the University renders a real service and one which will eventually have an important bearing on our social and economic progress. It will follow to some extent a series of interesting lectures on town planning previously delivered at the University by Mr. Thomas Adams but will be more comprehensive in the number of subjects and practical problems to be presented. The course in which connection a nominal fee of two dollars will be charged, will be open to any person, professional or otherwise, interested in civic development, and those desirous of attending and taking advantage of the opportunity offered, should notify the Director, University Extension, University of Toronto, before December 31st.

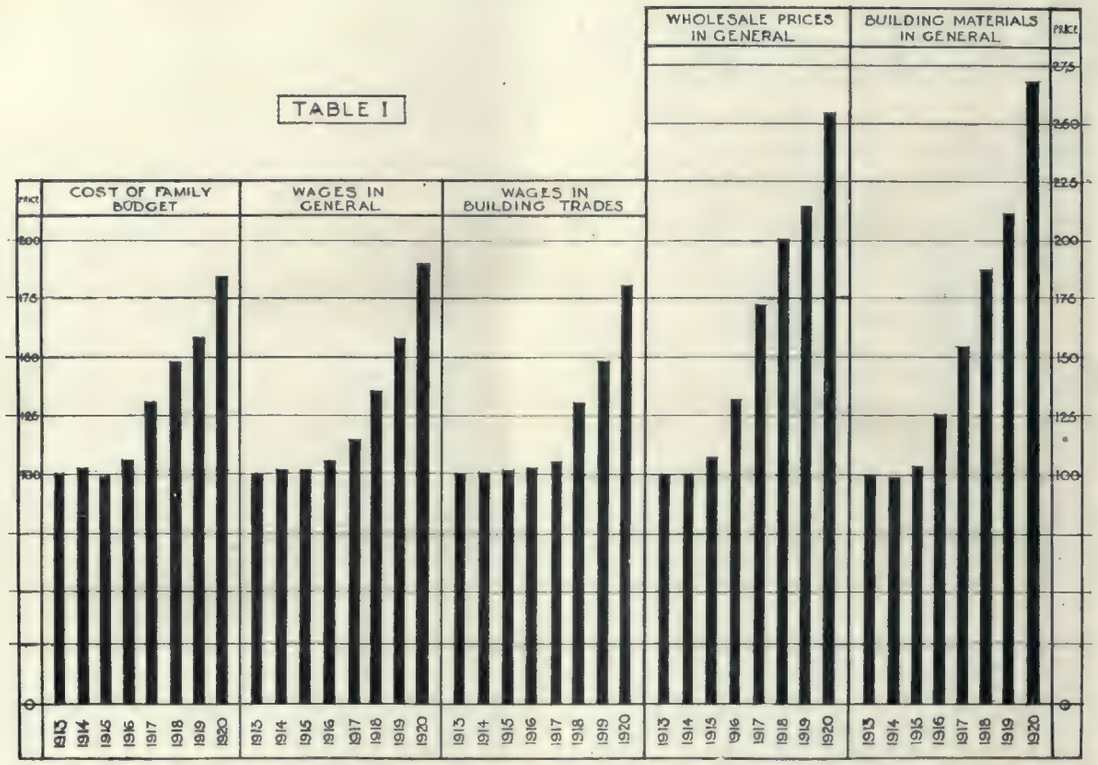


TABLE I. SHOWING BUILDING MATERIAL AND WHOLESALE PRICES IN GENERAL FROM 1913 TO 1920 IN RELATION TO WAGES AND THE FAMILY BUDGET

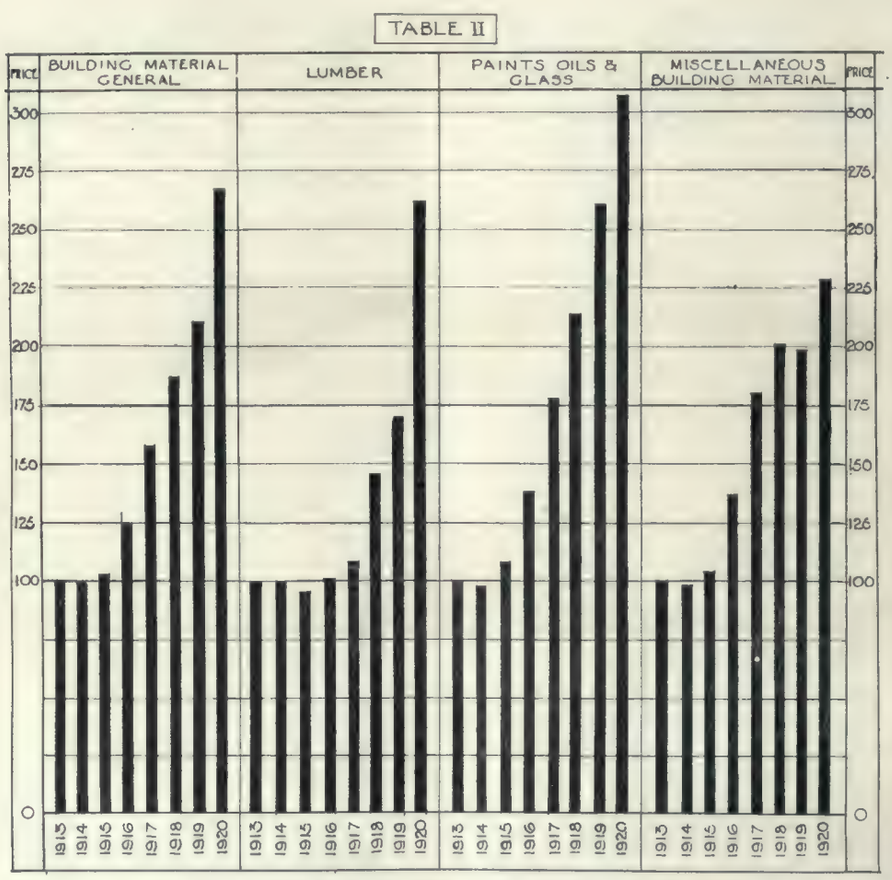


TABLE II. SHOWING PRICE LEVELS OF GENERAL AND MISCELLANEOUS BUILDING MATERIALS FROM 1913 UP TO THE END OF 1920

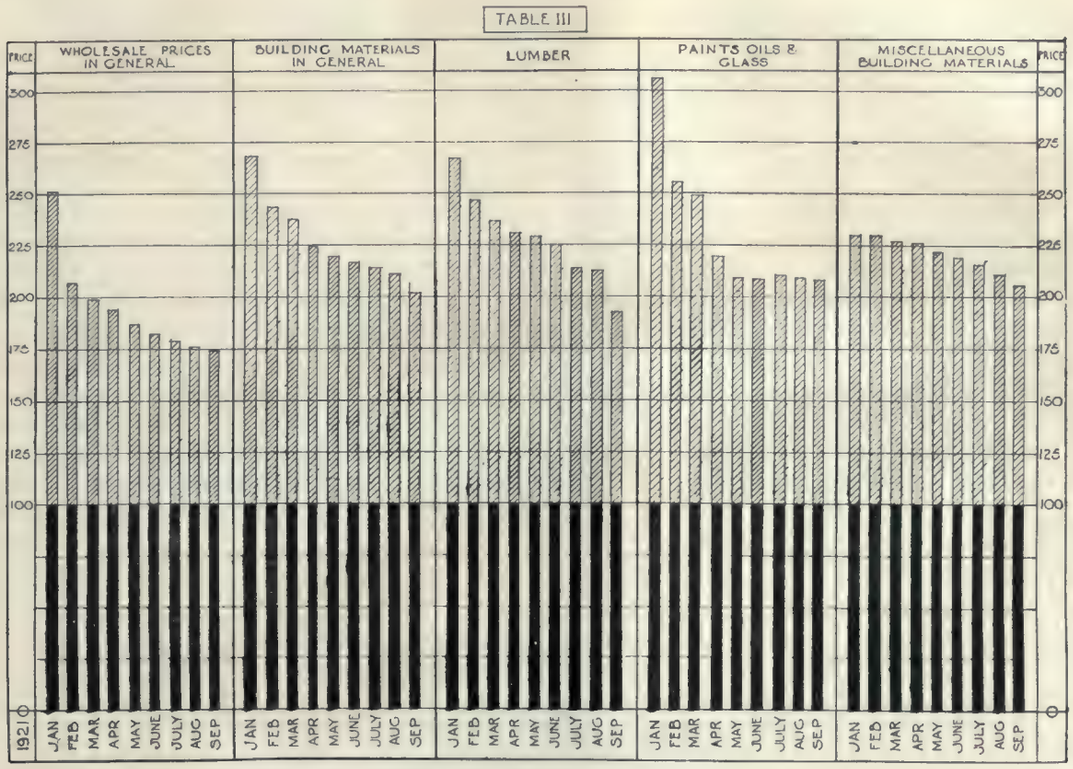


TABLE III. SHOWING DOWNWARD TREND OF PRICES DURING THE PRESENT YEAR, UP TO AND INCLUDING THE MONTH OF SEPTEMBER, OF LUMBER, PAINTS, OILS AND GENERAL AND MISCELLANEOUS BUILDING MATERIALS

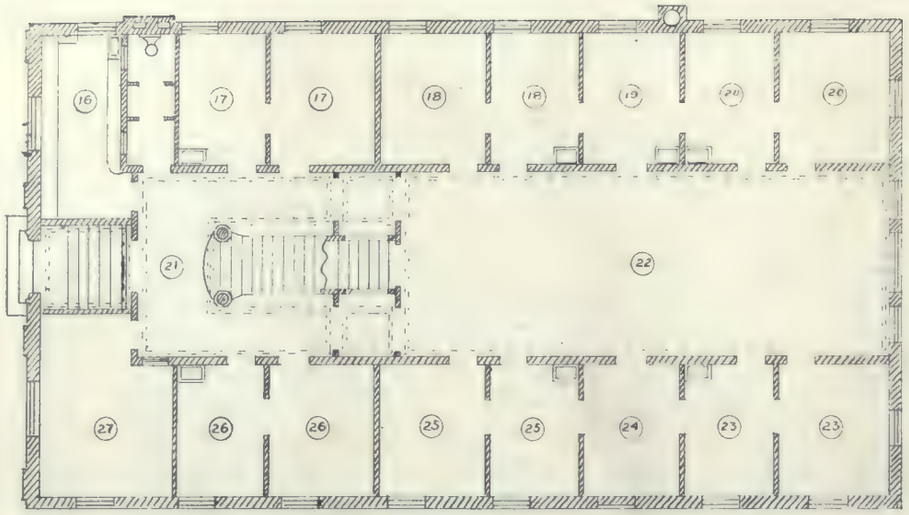
War Time and Present Price and Wage Levels

The accompanying tables have been prepared from information compiled by Mr. Hubert R. Kemp of the Department of Political Economy of the University of Toronto. In these tables the year 1913 has been taken as a basic year for index numbers and the average of prices for that year is taken at a basic figure of 100.

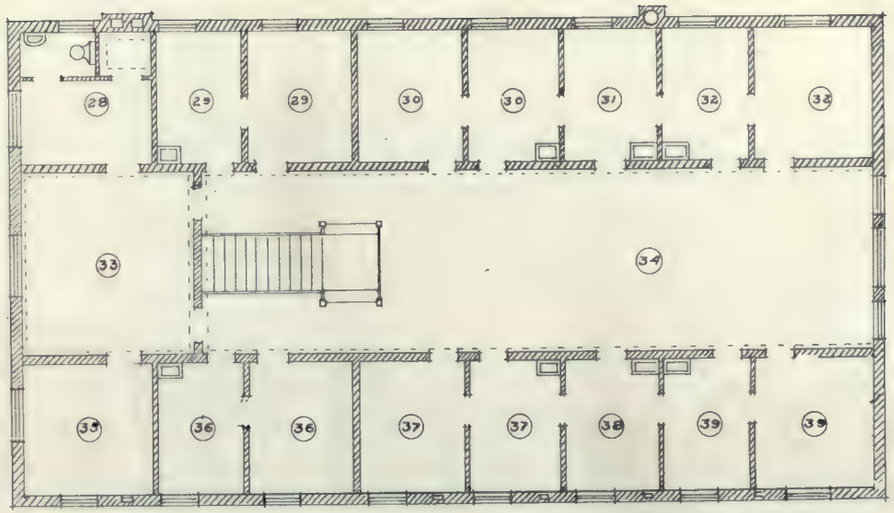
In Table No. 1, the general trend of prices for general merchandise, building materials, wages in general and wages in the building materials is shown and these are compared with the family budget. It will also be noted that the cost of building materials closely follows that of general merchandise though the prices of building materials rise somewhat faster than wholesale prices in general. Wages in the building trades closely follow the rise in wages in general and the rise in the cost of the family budget but lag slightly behind both of these. The prices of building materials closely follow the rise in prices in general but exceed them slightly.

Table No. 2 shows the range in prices of the three subdivisions which are included in the table showing the prices of building materials generally.

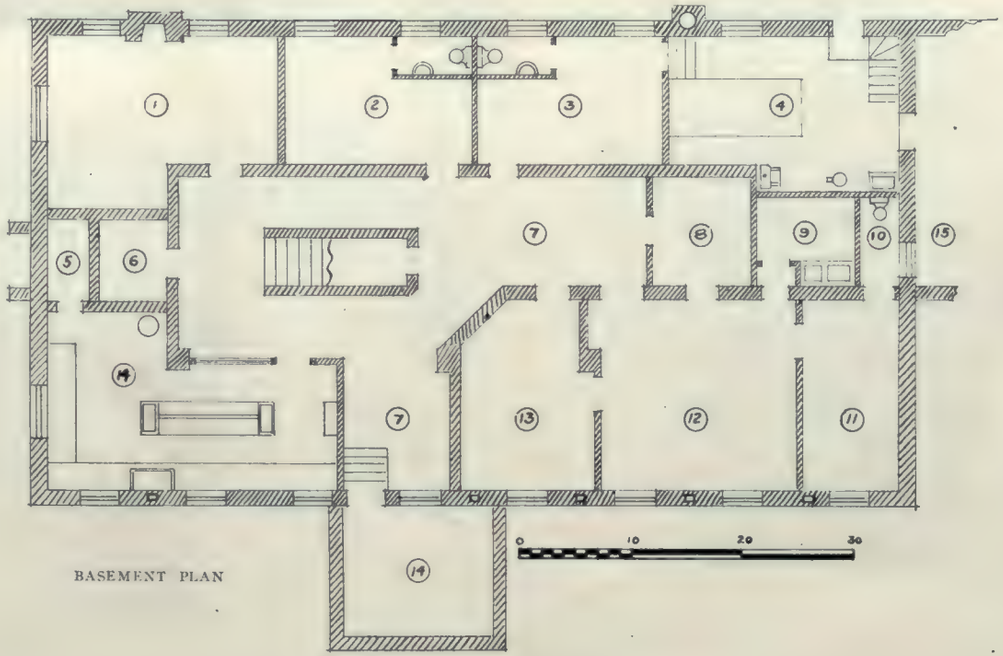
Table No. 3 brings the prices of general merchandise and building materials down to September 1921 with the variation for each month of the year. This table is on the same scale as Table No. 1 and the light portions of the different columns indicate the increase in prices over the basic prices of 1913. Generally speaking there has been a marked decline in all prices. But the decline has not been uniform and it is interesting to notice the varying degrees in which the main classes of building materials have adjusted themselves to the changed conditions of 1921.



FIRST FLOOR PLAN



SECOND FLOOR PLAN



BASEMENT PLAN

Basement

1—Board Room
2—Ladies' Rest Room
3—Men's Rest Room
4—Boiler Room
5—Vault
6—Vault
7—Hall
8—X-Ray Store Room
9—Developing Room
10—Lavatory
11—Fluoroscopic Room
12—General X Ray Room
13—X Ray Treatment Room
14—Area Vault
15—Coal Vault

First Floor

16—Dispensary
17—Suite No. 1
18—Suite No. 2
19—Surgery
20—Suite No. 3
21—Entrance Hall
22—Waiting Room
23—Suite No. 4
24—Fluoroscopic Room
25—Suite No. 5
26—Suite No. 6
27—Secretary's Office

Second Floor

28—Cloak Room
29—Suite No. 7
30—Suite No. 8
31—Surgery
32—Suite No. 9
33—Lecture Room
34—Waiting Room
35—Library
36—Suite No. 10
37—Suite No. 11
38—Fluoroscopic Room
39—Suite No. 12

STANDARD MEDICAL AND SURGICAL CLINIC PETERBOROUGH, ONT.

W. H. BARRY, ARCHITECT

Standard Medical and Surgical Clinic Peterborough, Ont.

IN Peterborough, Ont., a number of doctors have during the past year, been carrying on what is proving a most successful experiment, in that they have grouped their activities with a view to deriving certain advantages in professional practice. In this connection they have erected a special building known as the Standard Medical and Surgical Clinic, in which they have associated offices and special facilities for practice which would ordinarily be beyond the reach of the single practitioner.

The idea closely follows a somewhat similar plan which has been tried out to some extent by dentists. Its advantages lie in the fact that while it implies co-operative effort, it does not preclude private or individual practice. Rather it co-ordinates special branches of medicine and surgery in one professional group with obvious advantages in the matter of consultation and in the use of modern facilities and clinical equipment. At Peterborough each of the six doctors in the group conducts his practice as formerly, with the exception that there is a certain division of the work among them whereby each one takes charge of a certain department to which he devotes his special efforts and attention.

The building itself which has been provided for this purpose involves certain special problems in that it represents the first building of its kind erected in the province. It is a two red brick structure, 44 x 80 ft., with Indiana limestone trimmings. The entrance is from Charlotte street into a white marble vestibule which in turn gives access to the entrance hall where a wide marble staircase leads to the second storey. The main floors consist of a large waiting room, six suites of offices, an emergency surgery and a fluoroscopic room. In addition to this is the secretary's office and a dispensary which are so placed as to be directly accessible to the entrance. The entrance hall and waiting room have marbloid floors and are finished in a color scheme of white and ivory. These two rooms are separated from each other by circular head archways or passages on either side of the staircase and are flanked on both sides by the various offices mentioned.

Each suite of offices is complete in itself and consists of two rooms for consultation and examination. In each room there are intake end exhaust ventilating ducts, separate lavatories, lighting and heating plugs electric signal system, and phones. These offices have double doors and have been thoroughly considered to obtain the best sound proof results in order to ensure the proper degree of privacy necessary to professional requirements. The finish here and in the treatment of this floor throughout is very simple in character, consisting of chastely detailed mouldings and trim, with a finely modelled plaster enrichment for the ceiling cornice in both the waiting room and hall.

STANDARD MEDICAL AND SURGICAL CLINIC, PETERBOROUGH, ONT.

From the standpoint of clinical equipment the chief features of the scheme are found in the basement which is reached directly from the waiting

ENTRANCE HALL AND STAIRCASE.

LABORATORY

STANDARD MEDICAL AND SURGICAL CLINIC, PETERBOROUGH, ONT.

W. H. BARRY, ARCHITECT

room by a well proportioned staircase. This part of the building is lighted by windows above the grade line on the four elevations. In it are situated the X-Ray laboratory, the library and board room, rest room for male and female patients, fireproof vaults, store rooms and boiler room.

OFFICE IN TYPICAL SUITE.

The X-ray department proper consists of an X-ray room for photography, a large treatment room, fluoroscopic room, developing room, stock room for records, plates etc., and lavatory. Special attention has been given to the lighting, heating and ventilation of these rooms, and also to the construction of the walls and ceiling which are lined with sheet lead in order to prevent the rays from penetrating to the other parts of the structure. The ground wires for machines are of special type and were installed before the building was commenced.

The laboratory which is an important part of the scheme has also been thoroughly considered for its purpose. In this room are testing tables equipped with cupboards and drawers for apparatus and accessories, large combination testing tables fitted with a sanitary drain and sinks, a fume cupboard with a specially constructed vitrified ventilating flue, and an electric and gas installation which is elaborate and complete.

All the rooms in the basement with the exception of the boiler room are decorated in ivory and white, the whole wood work being enamelled. The boiler room itself is of fireproof construction, and the heating plant consists of a vapor or low pressure system.

The second story of the building contains additional clinical facilities sufficient to meet future requirements and is similar to the other floors in its arrangement and appointments.

In connection with the clinic a systematic record of each patient is kept. Special forms have been prepared for carrying this out and each doctor's desk has a filing system for the cases under treatment. In addition to this there is a general filing system in the secretary's office.

The board room or library has a brick fireplace, and is fully equipped with standard medical books and periodicals. This room is used for regular weekly meetings at which results of any investigation or

SURGERY

RECEPTION ROOM.

X-RAY ROOM

STANDARD MEDICAL AND SURGICAL CLINIC, PETERBOROUGH ONT.

W. H. BARRY, ARCHITECT.

special work are thoroughly discussed. In this way each member of the group is kept fully informed of the progress which is being made in the other branches of medical or surgical work with which he is not so intimately in touch.

The building is equipped with a modern ventilating system which in conjunction with the heating plant, insures control of the air conditions in each room; also with apparatus for fire protection, an inter-communicating phone system and sanitary drinking fountains on each floor.

Hamilton Chapter Doings

At the regular semi-monthly of the Hamilton chapter of the Ontario Association of Architects held at the Royal Connaught Hotel on November 30, the chapter selected two of its members—Gordon J. Hutton and Stewart McPhie—to represent it at a meeting of the sub-committee of the city council in matters relating to a civic building engineer and civic architectural work. The chapter is anxious to be of service in the promoting of better architecture and building conditions in Hamilton, and is frequently called upon for advice in these matters.

At the request of the Town Planning Board, the architects also appointed T. J. Fryer and George T. Evans to represent them on that body for 1922.

A report submitted by Mr. B. F. Kelly, Hamilton's representative on the Council of the O.A.A., dealt in part with the representation recently given to the Hamilton chapter on the recently formed committee on chapter constitutions.

Another feature of the meeting was an interesting address by E. H. Darling, president of the Hamilton branch ofthe Engineering Institute of Canada.

Local architects recently admitted to membership in the Ontario Association and who are entitled to practice under the title of "Registered Architect" are: W. Scott, W. R. Souter and Paul Domville.

At the meeting on December 14, a most interesting talk was delivered by W. N. Carlton of the Hamilton Public Library.

Master Masons Hold Convention

Questions of the continent-wide importance to the building industry were discussed in the annual report of Secretary W. T. McGarvey at the convention of the Mason Contractors' Association of the United States and Canada, held in London on December 12, 1914.

Dealing with wages and other items affecting the building trades the Secretary reported "that with falling prices and industrial difficulties some of the local joint arbitration boards had been passing through troubled waters by warning the journeymen that a world-wide depression was upon us, and that the continuance of high wages was detrimental to business. In a great many cities the wisdom of the men prompted a reduction, while in other cities there was a refusal, and we believe this refusal was partially the cause of only 72 per cent. of building mechanics being employed in 51 cities that reported."

The association adopted a resolution advocating steps to bring down the cost of building material and wages as a means of stimulating the industry throughout America. It was urged that freight rates on materials should be lowered, and supply dealers were asked to cut their rates to the lowest permissible level. The policy of the association is to adjust wages by conciliation and co-operation rather than by strikes and lockouts, and an effort is therefore to be made to interest the workers in the movement.

Members of the association are also to carry out an inquiry with a view to securing revision and a measure of standardization in local municipal building ordinances. It is claimed that in certain cities the enforcement of obsolete laws calling for heavy walls in comparatively low buildings is tending to favor frame construction.

Over a hundred delegates were in attendance at the convention. Robert Gillespie of St. Louis, Mo., a former Londoner, was re-elected to the Presidency. Other officers elected were: W. H. McGarvey of Cincinnati, Secretary-Treasurer; Harry Fenton of Indianapolis, Counsellor; Harry Jennings of Toronto Vice-President for the Province of Ontario. It was decided to hold next year's convention at Columbus, Ohio.

In the report of E. L. Cousins of the Department of Industries Toronto, recently submitted to the Board of Control, the definite opinion is expressed that "good times are just around the corner," Mr. Cousins stated that representatives of 17 United States industries have recently investigated manufacturing possibilities in Toronto, and, in the judgment of the department, there are excellent chances of a number of new branches being opened shortly.

The Ontario Government's Effort to Stimulate Business

The unemployment problem like the poor, is always with us. Canada, (and within her boundaries, Ontario) is so situated that a large proportion of her revenue producing activities must be started and finished during the open weather months. At the close of this period a market must be found for the labor consequently turned loose.

Fortunately we are not over populated. Those industries which have been working under a labor handicap the greater part of the year, readily absorb most of the skilled, and a proportion of the unskilled material available. The bulk of the labor must be "taken care of" each winter.

In so doing, detailed methods vary widely, though two broad plans are generally accepted. One —the creation of new works, usually public in their application; and the other a giving of relief or food

direct to the needy. In the latter instance—admittedly pernicious—the administration may take many different forms though the principle remains the same.

In the former, the one in which we are most interested, a number of factors must be taken into consideration. Of necessity, the created or "held over" works must be of such form as to permit to a large extent the employment of the unskilled man. These works are carried on usually under adverse weather conditions, and thus cannot be depended upon as a steady source of income to the employees.

Logically, the only way to remove from the public shoulders the huge expense of looking after the jobless, is to create steady employment. Steady Employment means "good business." "Good business" in every sense of the word. A man with a job is a solid citizen, and what is more, he belongs to the purchasing class. By instinct, and of necessity he buys. Give him a job, give him wages and he makes a good customer and that is exactly what we need—good customers.

The average man feels, that for the last year he has been making sacrifices. The cost of living as he sees it, has not decreased nearly so rapidly as his wages. He feels that under the present conditions his wages have not the purchasing power they should have. He is inclined to wait. "Things will be better in the spring, is the way he looks at the situation, and when spring arrives, he reverts to another equally ancient slogan. "Things will pick up when the crops are in." In the meantime, he waits. He has to be convinced that though living may be slightly cheaper in the Spring, he will gain nothing by waiting. The few dollars he is in a position to spend, if thrown into the market now, will have a wonderfully stimulating, and at the same time a steadying influence on trade. But he has to be convinced; and the best way to convince him is by assurance of the whole hearted co-operation of every merchant in the Dominion, every merchant to lay his cards on the board and frankly show his hand. Every manufacturer, every trader to state openly that he has taken, or will take a loss on those stocks he purchased when prices were high, and the goods now offered for sale represent only a fair profit over present day replacement costs. This action needs to be collective to be convincing.

With the object of uniting every class of manufacturer and merchant; builder and banker; farmer and worker in a Province—wide effort to better trade conditions, the Ontario Government has started a campaign, the guiding slogans of which are, "Buy—Build—Work," and "A Job for Every Man, Prosperity for All."

Last June Premier Drury called into consultation prominent men from every class of commercial activity. Manufacturing, wholesale, retail, building, banking, farming and labor were represented. These men constitute his Advisory Committee on Unemployment. The committee is composed of,—Premier E. C. Drury, chairman; Donald A. Cameron, financial interests; John W. Doggett, labor; George Gander, building and contracting interests; Hugh McDonald, Canadian Manufacturers' Association; Charles Marriott, Board of Trade; R. F. Fitzpatrick, Retail Merchants Association; W. C. Good, agricultural representative; Hon. W. R. Rollo, Minister of Labor; James H. H. Ballantyne, Deputy Minister of Labor.

The entire situation was thoroughly reviewed. As each succeeding month presented fresh developments, they were accorded consideration, and their individual bearing on the general conditions noted. As a result of these systematic probings the committee felt that in addition to the Government's plan for relief work, the existing conditions should be given strong publicity. This is being done. The Department of Labor has the direction of the campaign. Due to the ramifications and popularity of their Employment Service Bureaus, the Department is able to gain personal contact with the most prominent men in over thirty cities and towns in Ontario. Backing this organization is a newspaper campaign.

Through the Press, direct appeals will be made to every class of industry and trade as well as to the worker, banker, farmer and plain Mr.-Man-on-the-Street.

Organizations in every locality from Fort William to Ottawa and Toronto to Timmins are being appealed to personally to help in this movement; Rotary, Kiwanis, Lion and Gyro clubs; Boards of Trade and Chambers of Commerce; all civic authorities.

Every association approached has enthusiastically supported the campaign. Labor bodies have expressed themselves as being heartily in accord with the principles involved, and are willing to take any steps which may help toward a solution. Industrial, commercial and social bodies are taking up the work, and in many cases have called special sessions in order that no time may be lost.

The campaign has started off with every indication of a successful outcome. Nothing short of a realization of the campaign slogan, can be accepted as indicative of complete success. "A Job for Every Man, Prosperity for All."

Appoints Sales Representative

The Kerr Engine Company, Limited, Walkerville Ont., has appointed Mr. William R. Stavert, 58 Manning Chambers, Toronto, as their sales representative covering all territory in Ontario from Hamilton east and the entire Province of Quebec. Mr. Stavert will represent the company in the sale of its products excepting radiator valves and water works contracts which will be handled direct from the Walkerville office. Mr. Stavert was until recently with Jenkins Bros., Limited, but severed his connection with that firm in order to engage in business on own account as a manufacturer's agent.

CONSTRUCTION

INDEX TO VOLUME XIV. JANUARY, 1921-DECEMBER, 1921

FRONTISPIECES—FULL PAGE ILLUSTRATIONS

Title	Month
Block Plan, University of Alberta, Edmonton	January
Reredos and Altar Church of St. John the Evangelist, Hamilton, Ont.	February
New Manitoba Parliament Building, Winnipeg, Man. Night Illumination of Dome	March
Lindenlea Estate, Ottawa Housing Commission Development. Plot Plan.	April
Administration Building, Bigwin Inn, Lake of Bays District, Ont.	May
Battlefield Memorial Design by Walter S. Allward	June
Country House of W. R. P. Parker, Esq., Erindale, Ont.	July
Garden Views, Residence at Hamilton, Ont.	August
New Merchants' Bank, King St. West, Toronto, Ont.	September
New Extension to Mutual Life Building, Waterloo, Ont.	October
Canada Bread Company's Bakery, Danforth Avenue, Toronto, Ont.	November

ILLUSTRATIONS

Exterior Views denoted by Ex., Interior by In., Plans by Pl.

Title and Location		Architect.	Month.	Page.
APARTMENTS—				
Drummond Apartments, Montreal		Audet & Charbonneau	February	46–48
BANK BUILDINGS—				
Canadian Bank of Commerce, Portage Avenue Branch, Winnipeg	Ex.	V. D. Horsburgh, F.R.I.B.A.	January	20
Canadian Bank of Commerce, Chatham, Ont.	Ex.	V. D. Horsburgh, F.R.I.B.A.	January	21
Canadian Bank of Commerce, St. Thomas, Ont.	Ex., Pl.	V. D. Horsburgh, F.R.I.B.A.	January	22–23
Canadian Bank of Commerce, Windsor, Ont.	Ex.	V. D. Horsburgh, F.R.I.B.A.	January	22
Canadian Bank of Commerce, Winnipeg, Man.	Ex., Pl.	V. D. Horsburgh, F.R.I.B.A.	January	24
Canadian Bank of Commerce, Moncton, N.B.	Ex.	V. D. Horsburgh, F.R.I.B.A.	January	25
Canadian Bank of Commerce, Hamilton, Ont.	Ex.	V. D. Horsburgh, F.R.I.B.A.	January	25–26
Molsons Bank, Market Square, Hamilton, Ont.	Ex., In.	Philip J. Turner, F.R.I.B.A.	April	106–107
Molsons Bank, Park and Bernard Avenue, Montreal	Ex., In.	Philip J. Turner, F.R.I.B.A.	April	108
Molsons Bank, Bedford, Que.	Ex., Pl.	Philip J. Turner, F.R.I.B.A.	April	109
Molsons Bank, Kitchener, Ont.	Ex., In	Philip J. Turner, F.R.I.B.A.	April	110–111
Molsons Bank, St. Thomas East, Ont.	Ex., In.	Philip J. Turner, F.R.I.B.A.	April	112
Molsons Bank, (Remodelled Branch), Ayr, Ont.	Ex., Pl.	Philip J. Turner, F.R.I.B.A.	April	113
Molsons Bank, Williamsburg, Ont.	Ex., Pl.	Philip J. Turner, F.R.I.B.A.	April	114
Merchants Bank, King Street West, Toronto	Ex., In.	Darling & Pearson	September	256
Union Bank, Vancouver, B.C.	Ex., In.	Somerville & Putnam	July	206
Bank of Montreal, Cherry and Villiers Streets, Toronto	Ex.	Darling and Pearson	December	371
Dominion Bank, City Hall Branch, Toronto	Ex., In.	Darling and Pearson	December	373
Dominion Bank, Yonge and Hayden Streets, Toronto	Ex., In.	Darling and Pearson	December	374
CHURCHES—				
Church of St. John the Evangelist, (Altar & Reredos) Hamilton, Ont.	Ex., In.	Witton & Walsh	February	34–37
CLINIC BUILDINGS—				
Standard Medical and Surgical Clinic, Peterborough, Ont.	Ex., In	W. H. Barry	December	383-386
EXHIBITION BUILDINGS—				
Live Stock Show Building, Toronto	Ex., In.	City Architect's Department	December	358-367
FACTORIES AND WAREHOUSES—				
Soren Bros., Toronto	Ex., Pl.	Harold S. Kaplan	January	31
Fielder Paper Box Company, Toronto	Ex., Pl.	Harold S. Kaplan	January	32

ILLUSTRATIONS—(*Continued*)

Title and Location		Architects	Month.	Page
Canada Bread Company's Bakery, Toronto		McCormick Co. & Charles S. Cobb,	November	324
Premier Tire & Rubber Company, Beamsville, Ont.	Ex., Pl.	Fryer & Evans	August	249
GARAGES—				
Garage, Sherbrooke, Que.	Ex., Pl.	Philip J. Turner, F.R.I.B.A.	May	140
HOTELS—				
Prince Edward Hotel, Windsor, Ont. (Progress Views)		Esenwein & Johnson, Watt & Blackwell & A. P. McPhail	November	344–347
HOUSES—				
Toronto, Ont., Dr. Geoffrey Boyd	Ex., In.	Page & Warrington	January	14–15
Toronto, Ont., House on Jackes Avenue	Ex., Pl.	Page & Warrington	January	16
Ottawa, Ont., Bungalow		C. P. Meredith	March	88–89
Ottawa, Ont., (Lindenlea Estate)	Ex., Pl.	F. E. Belfry	April	97–103
Hamilton, Ont., (Housing Development)	Ex., Pl.	W. L. Somerville	April	118–122
Erindale, Ont., W. R. P. Parker	Ex., In.	A. S. Mathers, Architect	July	192–197
Lake Rosseau, Ont. Summer Home Sir John C. Eaton	Ex., Pl.	Wickson & Gregg, Architects	August	241–245
Ancaster Ont., Memorial Garden Village	Ex., Pl.	Fryer & Evans	September	260
Toronto (near) D. A. Dunlap	Ex., In.	Wickson & Gregg	October	302
Toronto, Frank H. Johnston	Ex., In.	Harold R. Watson	October	308
Toronto, Ont., Mrs. Oscar Taylor	Ex., Pl.	Harold R. Watson	October	220
Brantford, Ont., Housing Development	Ex., Pl.	Scott & Wardell	November	336
Port Credit, Ont., House	Ex., Pl.	Wickson & Gregg	November	350–351
LANDSCAPE WORK—				
Subject and Location		Landscape Architect	Month.	Page
Country House, W. R. P. Parker, Erindale, Ont.		W. E. Harries, A. V. Hall and Arthur M. Kruse, (Associate)	July	192–197
Estate, E. R. Wood, Toronto		W. E. Harries and A. V. Hall and Arthur M. Kruse, (Associate)	August	225
Ashburnham Estate, Oakville, Ont.		W. E. Harries, A. V. Hall, and Arthur M. Kruse (Associate)	August	227
Garden Views, Rosedale, Toronto, Ont.		W. E. Harries, A. V. Hall and Arthur M. Kruse (Associate)	August	232
Residence, Dunvegan Road, Toronto, Ont.		W. E. Harries, A. V. Hall and Arthur M. Kruse (Associate)	August	227
Residence, Whitney Ave., Toronto, Ont.		W. E. Harries, A. V. Hall and Arthur M. Kruse (Associate)	August	232
Tea Garden, Old Mill, Toronto, Ont.		W. E. Harries, A. V. Hall and Arthur M. Kruse (Associate)	August	233
Rose Garden "Raymar," Oakville, Ont.		W. E. Harries, A. V. Hall and Arthur M. Kruse (Associate)	August	234–235
Summer Home, Sir John C. Eaton, Lake Rosseau, Ont.		W. E. Harries, A. V. Hall and Arthur M. Kruse (Associate)	August	241–245
Lansdowne Park Housing Scheme, Brantford, Ont.		H. B. & L. A. Dunington-Grubb	November	336–341
MEMORIALS—				
Battle Field Memorial		Competitive Designs	June	160–170
Battle Field Memorial		Walter S. Allward	June	160
Battle Field Memorial		F. Chapman Clemesha	June	161
Battle Field Memorial		A. J. King	June	162
Battle Field Memorial		Duke W. Rowat	June	163
Battle Field Memorial		R. T. Perry	June	164
Battle Field Memorial		F. Lassore	June	164
Battle Field Memorial		Domville & Husband	June	165
Battle Field Memorial		George E. Tremblay	June	166
Battle Field Memorial		Kenneth E. Rae	June	166
Battle Field Memorial		Ramsay Traquair	June	167

ILLUSTRATIONS—(*Continued*)

Title and Location		Architect	Month	Page
Battle Field Memorial		W. A. & C. A. Gagnon	June	167
Battle Field Memorial		Cecil Burgess	June	168
Battle Field Memorial		J. Emile Vanier	June	168
Battle Field Memorial		S. D. Ritchie	June	169
Battle Field Memorial		Charles S. Cobb	June	169
Battle Field Memorial		G. W. Hill	June	170
Bronze Tablet, Royal Canadian Dragoons 91st Regiment, Hamilton, Ont.		Fryer & Evans	August	250
Proposed Memorial Arch, Royal Military College, Kingston, Ont.		John M. Lyle	March	93
War Memorial Sketch Model		Walter S. Allward	November	334–335
War Memorial Sketch Model		F. Chapman Clemesha,	November	335
MAUSOLEUM				
Mausoleum, Mount Pleasant, Toronto, Ont.	Ex., In.	Darling & Pearson	September	264
PUBLIC BUILDINGS.				
Manitoba Parliament Buildings, Winnipeg, Man.	Ex. In.	Frank W. Simon, F.R.I.B.A.	March	68
OFFICE BUILDINGS—				
Canada Cement Company's Building, Montreal	Ex., Pl.	Barrott & Blackader	September	281
Mutual Life Building, (New Extension) Waterloo, Ont.	Ex., In.	Sharp & Horner	October	288
REGISTRY OFFICES—				
Halton County Registry Office, Milton, Ont.	Ex., Pl.	Molesworth, West & Secord	May	152–153
University of Alberta, Edmonton	Ex., Pl.	Nobbs & Hyde	January	2–12
SCHOOLS—				
College of Medicine, University of Alberta, Edmonton	Ex., Pl.	Nobbs & Hyde	January	2–12
Arts Building, University of Alberta, Edmonton	Ex.	Nobbs & Hyde	January	2–12
Norway Primary School, Toronto, Ont.	Ex., In.	George, Moorhouse & King	February	38–40
Rawlinson School, Toronto	Ex., Pl.	D. R. Franklin	June	175
John Ross Robertson School, Toronto, Ont.	Ex., In.	D. R. Franklin	June	177–179
Small School, Oakville, Ont.	Ex., Pl.	Molesworth, West & Secord	June	182–183
High School, Walkerville, Ont.	Ex., In.	Boyde & Thompson	July	200–201
STUDENTS' WORK, McGILL UNIVERSITY, MONTREAL—				
City Church	Ex., Pl.	Design by A. L. Perry	September	273
Community Theatre	Ex., Pl.	Design by L. E. Brown	September	274
STORES—				
Store Front, Laura Secord Candy Co., Toronto, Ont.		Molesworth, West & Secord	May	142
THEATRES—				
Allen Theatre, Vancouver, B.C.	Ex., In.	C. Howard Crane	July	212–215

ILLUSTRATIONS ACCORDING TO AUTHORS

Architect	Subject and Location	Month	Page
Allward, Walter S. (sculptor)	Battlefield Memorial Design	June	160
Allward, Walter S.	Battlefield Memorial Sketch Model	November	334–335
Audet & Charbonneau	Apartments, Montreal	February	46– 48
Barrott & Blackader	Office Building, Montreal	September	281
Belfry, F. E.	Housing Development, Ottawa	April	97–103
Boyd & Thompson	High School, Walkerville, Ont.	July	200–201
Burgess, Cecil	Battlefield Memorial Design	June	168
Burgess, Cecil	Provincial College of Medicine, University of Alberta, Edmonton Alberta.	January	2– 12
Chapman & McGiffin	Ashburnham Estate, Oakville, Ont.	July	228–230
Clemesha, F. Chapman	Battlefield Memorial Design	June	161
Clemesha, F. Chapman	Battlefield Memorial Sketch Model	November	335

ILLUSTRATIONS ACCORDING TO AUTHORS—(*Continued*)

Architect	Subject and Location	Month	Page
Cobb, Charles S.	Battlefield Memorial Design	June	169
Crane, C. Howard	Theatre, Vancouver, B.C.	July	212–215
Darling & Pearson	Bank, Toronto	September	256
Darling & Pearson	Mausoleum, Toronto	September	264
Domville & Husband	Battlefield Memorial Design	June	165
Dunington-Grubb (Landscape Architects)	Housing Development, Brantford, Ont.	November	336–341
Esenwein & Johnson, Watt & Blackwell and A. H. McPhail, Associates	Hotel, Windsor, Ont.	November	344–347
Franklin, D. R.	School, Toronto	June	177–179
Franklin, D. R.	School, Toronto	June	175
Fryer & Evans	Memorial Garden Village, Ancaster, Ont.	September	260
Fryer & Evans	Memorial, Hamilton, Ont.	August	250
Gagnon, W. A. and C. A.	Battlefield Memorial Design	June	167
Hill, G. W.	Battlefield Memorial Design	June	170
Horsburgh, V. D., F.R.I.B.A.	Bank, Winnipeg, Man.	January	20
Horsburgh, V. D., F.R.I.B.A.	Bank, Chatham, Ont.	January	21
Horsburgh V. D., F.R.I.B.A.	Bank, St. Thomas	January	22– 23
Horsburgh, V. D., F.R.I.B.A.	Bank, Windsor, Ont.	January	22
Horsburgh, V. D., F.R.I.B.A.	Bank, Winnipeg, Man.	January	24
Horsburgh, V. D., F.R.I.B.A.	Bank, Moncton, N.B.	January	25
Horsburgh, V. D., F.R.I.B.A.	Bank, Hamilton, Ont.	January	25– 26
Kaplan, Harold S.	Warehouse, Toronto	January	31
Kaplan, Harold S.	Warehouse, Toronto	January	32
King, A. J.	Battlefield Memorial Design	June	162
Lassore, F.	Battlefield Memorial Design	June	164
Lyle, John M.	Proposed Memorial Arch, Kingston, Ont.	March	93
Mathers, A. S.	Country House, Erindale, Ont.	July	192–197
Meredith, C. P.	Bungalow, Ottawa, Ont.	March	88– 89
Molesworth, West & Secord	Registry, Milton, Ont.	May	152-153
Molesworth, West & Secord	Store front, Toronto	May	142
Molesworth, West & Secord	School, Oakville, Ont.	June	182–183
Moorehouse, George and King	School, Toronto	February	38– 40
Nobbs & Hyde	University Buildings, Edmonton, Alta.	January	2– 12
McCormick Co. and Charles S. Cobb Associates	Bakery	November	324–329
Page & Warrington	House, Toronto, Ont.	January	14– 15
Page & Warrington	House, Toronto, Ont.	January	16
Perry, R. T.	Battlefield Memorial Design	June	164
Rae, Kenneth E.	Battlefield Memorial Design	June	166
Ritchie S. D.	Battlefield Memorial Design	June	169
Rowat, Duke W.	Battlefield Memorial Design	June	163
Scott & Wardell	Housing Development, Brantford, Ont.	November	336
Sharp & Horner	Office Building (Extension) Waterloo, Ont.	October	288
Simon, Frank W., F.R.I.B.A.	Parliament Buildings, Winnipeg, Man.	March	68
Somerville & Putnam	Bank, Vancouver B.C.	July	206
Traquair, Ramsay	Battlefield Memorial Design	June	167
Tremblay, George E.	Battlefield Memorial Design	June	166
Turner, Philip J.	Bank, Hamilton, Ont.	April	106–107
Turner, Philip J.	Bank, Montreal	April	108
Philip J. Turner F.R.I.B.A.	Bank, Bedford, Que.	April	109
Philip J. Turner F.R.I.B.A.	Bank, Kitchener, Ont.	April	110–111
Philip J. Turner F.R.I.B.A.	Bank, St. Thomas, East, Ont.	April	112
Philip J. Turner F.R.I.B.A.	Bank (Re-Modelled) Ayr, Ont.	April	113
Philip J. Turner F.R.I.B.A.	Bank, Williamsburg, Ont.	April	114
Philip J. Turner F.R.I.B.A.	Garage, Sherbrooke, Que.	May	140
Vanier, J. Emile	Battlefields Memorial Design	June	168
Watson, Harold R.,	Residence & Studio, Toronto, Ont.	October	308
Watson, Harold R.	House, Toronto, Ont.	October	220

ILLUSTRATIONS ACCORDING TO AUTHORS—(*Continued*)

Architect	Subject and Location	Month	Page
Wickson & Gregg	Summer House, Lake Rosseau, Ont.	August	241–245
Wickson & Gregg	Country House, near Toronto, Ont.	October	302
Wickson & Gregg	House, Port Credit, Ont.	November	350–351

ARTICLES

Title	Month.	Page.
Construction at the University of Alberta, Edmonton, Alberta	January	3– 12
O. A. A. Notes	January	12
Is "Cost-Plus" justified?	January	17– 18
Mural Painting	January	19
Lands for Public Purposes	January	25– 27
Recent Branches, Canadian Bank of Commerce	January	21
Draftsmen Association, Toronto	January	30
University Lectures on Town Planning	January	31– 32
Winnipeg Building Conference	February	42– 43
Outlook for Construction Work	February	43– 48
Evolution of Architecture	February	49–53–64
Economics of Building Design	February	54– 61
O. A. A. Notes	February	61
New Manitoba Parliament Building	March	67– 76
Mechanical Equipment, Manitoba Parliament Building	March	77– 79
Economics of Town Planning	March	80–82
Why Houses are Not built	March	86– 93
O. A. A. Notes	March	90
Estrangement Between Engineers and Architects	April	101–103
Government Architectural Departments	April	104–105
Ethics for the Contractor	April	105
Forest Experimental Station	April	111
Architectural Management	April	115–117
Building Materials and Prices	April	123
Structural Materials	April	124
Monumental Architecture and Town Planning	May	137–136
Apprentices for the Building Industry	May	141
Machine-Made Reinforced Concrete Structures	May	143–151
Ottawa Conference	May	154
Canadian Battlefields Memorials Competition	June	161–172
Building Materials & Research Work	June	172–185
O. A. A. Notes	June	184
What can Architects do to Stimulate Building	June	188
The Ontario Architects' Bill	July	197
Why and When the Services of an Architect are Required	July	198
Land Subsidence and its Effects	July	203–221
Illinois Architects Question Contractors' Rights to Fix Working Conditions and Wages	July	209
Quantity Survey and Payment for Estimating	July	210
Some Problems in Theatre Construction	July	213–216
Toronto Conference on Wage Reduction	July	218
Uncompensated Services	July	218
Landscape Architecture	August	225–231
Professional Practice in Landscape Architecture	August	234
Waste in the Building Industry	August	236– 24
O. A. A. Proceedings	August	246
A Memorial Garden Village	September	260–262
President H. E. Moore's Address	October	296
Stagnation in the Building Industry	October	297
Building Material Costs and Wages	October	299
Country House, D. A. Dunlap, (near) Toronto	October	303
R. A. I. C. and O. A. A. Joint Convention	October	310–313
Address by Irving K. Pond A. I. A.	October	314–319
Land Tenure and its Effects on Town Planning	November	329–333

ARTICLES—(*Continued*)

Title	Month	Page
Wages and Per Capita Wealth	November	333
Architectural Education	November	342–344
How to build a House	November	349–351
Town Planning in Ontario	November	352
The Economics of Town Planning	November	356
Brief History of Canadian Battlefield Memorials Competition	December	367
Canadian Sitka Spruce	December	375
Town Planning at University of Toronto	December	379
War Time and Present Price and Wage Levels	December	381
Ontario Government's Effort to Stimulate Business	December	387

EDITORIALS

	Month.	Page
Ontario Engineers' Draft Bill on Legislation	January	29
The New Draftsmen's Association	January	30
Ontario Town Planning Conference	February	63–64
Delayed Public Buildings	March	91
Building Employers and Employees to Confer	March	91
Financing Small Houses	April	125
Sales Tax in the Construction Industries	April	125–126
The Live Stock Arena Contract	May	155
Toronto Chapter Exhibition	May	155
Standard Form of Contract	May	155
Government Ownership of Cement Mills	May	156
Government Aid for Housing	May	156
A Recent Legal Decision	June	189
The Ontario Architects' Bill	July	219
Town Planning at Toronto University	July	219
R. A. I. C. and O. A. A., Joint Discussion	August	251
Better Building Prices	September	283
The Use of Advertisements	September	284
Opportunity for Canadian Architects	October	221
O. A. A. Executive Plan Busy Year	November	357

THE STRATFORD MANUFACTURING COMPANY, LTD.
Manufacturers of
Assembly Seating (as illustrated) Folding Chairs and Tables; Seats for Rinks, Parks and Grand Stands; Ladders, Etc.
If interested write for catalogue "R"
STRATFORD ONTARIO

J. P. Anglin, B.Sc., President. *H. J. Gross, Vice-Pres. & Treas.* *C. D. Harrington, B.Sc., Vice-Pres. & Manager.*
ANGLIN-NORCROSS LIMITED
CONTRACTING ENGINEERS AND BUILDERS.
MONTREAL TORONTO HALIFAX

Solignum
Wood Preservative—Shingle Stain—supplied in special grades for interior woodwork. Made by Major & Co., Limited, Hull, England.

PARIPAN
The finest enamel for plaster or wood; flat or gloss, in colors. Made by Paripan Limited, London, England.

FLINTEX
Concrete hardener—makes floors frost, dust and wear-proof. Made by us here.

STURGEONS
French Polish Wax—the best wax on the market for all purposes. Made by us here.

STURGEONS LIMITED
BRITISH PAINT SPECIALTIES
64-66 RICHMOND STREET E., TORONTO